FUTURE FISHERIES IMPROVEMENT PROGRAM GRANT APPLICATION

Please fill in the highlighted areas
all sections (IA, IB, IC, etc.) must be addressed or the application will be considered invalid

I. APPLICANT INFORMATION

A. Applicant Name: Gallatin River Task Force

B. Mailing Address: PO Box 160513

C. City: Big Sky State: MT Zip: 59716

Telephone: 406-993-2519 E-mail: Kristin@gallatinrivertaskforce.org

D. Contact Person: Kristin Gardner

Address if different from Applicant: NA

City: State: Zip:

Telephone: E-mail:

E. Landowner and/or Lessee Name (if other than Applicant): US Forest Service

Mailing Address: 3710 Fallon Street, Suite C

City: Bozeman State: MT Zip: 59718

Telephone: 406-522-2535 E-mail: wurie@fs.us.gov

II. PROJECT INFORMATION*

A. Project Name: Moose Creek Restoration Project

River, stream, or lake: Gallatin River

Location: Township: 5S Range: 4E Section: 36
Latitude: 45.3566 Longitude: -111.172 *within project (decimal degrees)*

County: Gallatin

B. Purpose of Project:

The Moose Creek Restoration project is the first restoration project of a long-term partnership between the Gallatin River Task Force and the Custer Gallatin National Forest to reduce erosion, enhance and protect fish and riparian habitat, and improve river access along the Upper Gallatin River between Spanish Creek and Yellowstone National Park.

C. Brief Project Description:

Moose Creek restoration [ADDL FULL DESIGN SHEETS AND REPORTS AVAILABLE]

The Moose Creek Restoration Project is the first demonstration project along the Upper Gallatin corridor to repair and protect the health of the river, riparian areas, and fisheries from degradation associated with unmanaged and increasing river use. These impacts include eroded streambanks, trampled riparian vegetation, and excessive unorganized trails to the river that contribute fine sediment to the Gallatin River and diminish fish and riparian habitat. Restoration activities planned at the Moose Creek Flat Restoration Area include enhancing streamside vegetation, adding riparian fencing, improving trail systems, stabilizing streambanks with bio-engineering techniques, and developing designated access sites for all user types. Measurable outcomes include for this project include: 1) 145 ft. of streambank stabilization using bioengineering techniques, 2) 10,939 sq. ft. of riparian plantings, 3) 1,460 ft. of riparian fencing, 4) 1,000 ft of trails, 5) repaired old bridge abutment with addition of rock terrace stairway to the river, 6) a boat ramp, 7) a kayak launch, and 8) two educational interpretive signs about river ecology and minimizing human impact by treading lightly and by practicing clean, drain, dry to prevent spread of aquatic invasive species. The project broke ground in Fall 2017 and will continue through Spring 2018.

D. Length of stream or size of lake that will be treated: 1,450 feet

E. Project Budget:

Grant Request (Dollars): $ 23,655

Contribution by Applicant (Dollars): $ 23,000 In-kind $ 11,060

(salaries of government employees are not considered as matching contributions)

Contribution from other Sources (Dollars): $ 206,246.50 In-kind $ 23,450

(attach verification - See page 2 budget template)

Total Project Cost: $ 287,411.50

F. Attach itemized (line item) budget – see template

G. Attach **specific project plans, detailed sketches, plan views, photographs, maps, evidence of landowner consent, evidence of public support and fish biologist support, and/or other information necessary to evaluate the merits of the project. If project involves water leasing or water salvage complete a *supplemental questionnaire*** (fwp.mt.gov/habitat/futurefisheries/supplement2.doc).

H. **Attach land management & maintenance plans that will ensure protection of the reclaimed area**.

III. PROJECT BENEFITS*

A. What species of fish will benefit from this project?:

This project will benefit westslope cutthroat trout, rainbow trout, brown trout, and mountain whitefish.

B. How will the project protect or enhance wild fish habitat?:

This project will protect and enhance wild fish habitat by rebuilding streambanks, enhancing streamside vegetation, providing riparian fencing, and allowing river access to specific locations.

C. Will the project improve fish populations and/or fishing? To what extent?:

This project will improve fish populations by improving their spawning habitat by reducing fine sediment transport to the streambed and by cooling water temperatures by enhancing riparian areas. This project will improve fishing by providing safer, easier access routes to the river.

D. Will the project increase public fishing opportunity for wild fish and, if so, how?:

This project will increase public fishing opportunity by providing easier, safer access routes to the river.

E. The project agreement includes a 20-year maintenance commitment. Please discuss your ability to meet this commitment.

The Gallatin River Task Force and Custer Gallatin National Forest can meet the required 20-year maintenance commitment. We will be developing a detailed maintenance plan over Winter 2018.

F. What was the cause of habitat degradation in the area of this project and how will the project correct the cause?:

The cause of the habitat degradation in the project area was caused by unorganized and unmanaged river access confounded with increasing river use every year. This project will correct the cause by building trails to the river for access and fencing remaining riparian areas. In addition, we will provide signage to educate the river users on the important need for these changes.

G. What public benefits will be realized from this project?:

Visitors and residents of southwest Montana will benefit from this project. The Gallatin River is an internationally recognized trout fishery, and the Moose Creek Flat Recreational Area is an important access point for many people who live in or visit the area.

H. Will the project interfere with water or property rights of adjacent landowners? (explain):

No. The Custer Gallatin National Forest owns all the land adjacent to the project area.

I. Will the project result in the development of commercial recreational use on the site?: (explain):

No. Commercial recreational use already exists on the site and is permitted through the Custer Gallatin National Forest. This project will not develop more recreational use.

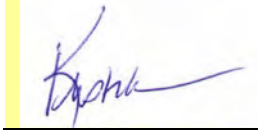
J. Is this project associated with the reclamation of past mining activity?:

No

Each approved project applicant must enter into a written agreement with Montana Fish, Wildlife & Parks specifying terms and duration of the project. The applicant must obtain all applicable permits prior to project construction. A competitive bid process must be followed when using State funds.

IV. AUTHORIZING STATEMENT

I (we) hereby declare that the information and all statements to this application are true, complete, and accurate to the best of my (our) knowledge and that the project or activity complies with rules of the Future Fisheries Improvement Program.

Applicant Signature:  Date: 11/30/17

Sponsor (if applicable):

***Highlighted boxes will automatically expand.**

Mail To: Montana Fish, Wildlife & Parks
Fisheries Division
PO Box 200701
Helena, MT 59620-0701

E-mail To: Michelle McGree
mmcgree@mt.gov
(electronic submissions MUST be signed)

Incomplete or late applications will be rejected and returned to applicant.
Applications may be rejected if this form is modified.

*****Applications must be signed and *received* by the Future Fisheries Program Officer in Helena *before* December 1 and June 1 of each year to be considered for the subsequent funding period**.***

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

Both tables must be completed or the application will be returned

WORK ITEMS (ITEMIZE BY CATEGORY)	NUMBER OF UNITS	UNIT DESCRIPTION*	COST/UNIT	TOTAL COST	CONTRIBUTIONS			
					FUTURE FISHERIES REQUEST	IN-KIND SERVICES**	IN-KIND CASH	TOTAL
Personnel* **								
Survey				$ -				$ -
Design	118	HRS	$98.59	$ 11,633.62			11,633.62	$ 11,633.62
Engineering	354	HRS	$100.59	$ 35,608.86			35,608.86	$ 35,608.86
Oversight	274	HRS	$107.73	$ 29,518.02	5,360.00		24,158.02	$ 29,518.02
Reporting	48	HRS	$110.00	$ 5,280.00	880.00		4,400.00	$ 5,280.00
Coordination	316	HRS	$35.00	$ 11,060.00		11,060.00		$ 11,060.00
			Sub-Total	$ 93,100.50	$ 6,240.00	$ 11,060.00	$ 75,800.50	$ 93,100.50
Travel								
Mileage	3200	MILE	$0.55	$ 1,760.00	214.00		1,546.00	$ 1,760.00
Per diem	0		$0.00	$ -	-			$ -
			Sub-Total	$ 1,760.00	$ 214.00	$ -	$ 1,546.00	$ 1,760.00
Construction Materials****								
Willows	3700	STAKES	$1.00	$ 3,700.00		3,700.00		$ 3,700.00
1-gallon	5	EACH	$6.00	$ 30.00	30.00			$ 30.00
1-gallon tall	193	EACH	$8.00	$ 1,544.00	1,544.00			$ 1,544.00
2-gallon	56	EACH	$10.00	$ 560.00	560.00			$ 560.00
5-gallon	34	EACH	$21.00	$ 714.00	714.00			$ 714.00
Fencing	1400	LINEAR FOOT	$1.50	$ 2,100.00	2,100.00			$ 2,100.00
Soaker hose	150	LINEAR FOOT	$0.25	$ 37.50	37.50			$ 37.50
Pump	1	EACH	$150.00	$ 150.00	150.00			$ 150.00
Streambank bioenginering		contractor provided flat fee, work complet	$23,850.00	$ 23,850.00	-		23,850.00	$ 23,850.00
Bank excavation		contractor provided flat fee, work complet	$7,500.00	$7,500.00	-		7,500.00	$ 7,500.00
Rock terrace and stairway		contractor provided flat fee, work complet	$42,500.00	$42,500.00	-		42,500.00	$ 42,500.00
Imported rock		contractor provided flat fee, work complet	$6,500.00	$6,500.00	-		6,500.00	$ 6,500.00
Trails		contractor provided flat fee, work complet	$6,825.00	$6,825.00	-		6,825.00	$ 6,825.00
Interpretive signs	2	each	$2,000.00	$ 4,000.00	-		4,000.00	$ 4,000.00
Topsoil	30	cubic yards	$20.00	$ 600.00		600.00		$ 600.00
Rock aggregate	60	cupic yards	$20.00	$ 1,200.00		1,200.00		$ 1,200.00
boat ramp		contractor provided flat fee, work complet	$21,375.00	$21,375.00	-		21,375.00	$ 21,375.00
kayak launch		contractor provided flat fee, work complet	$11,400.00	$11,400.00	-		11,400.00	$ 11,400.00
1-gallon	5	EACH	$6.00	$ 30.00	$30.00			$ 30.00
1-gallon tall	193	EACH	$8.00	$ 1,544.00	$1,544.00			$ 1,544.00
2-gallon	56	EACH	$10.00	$ 560.00	$560.00			$ 560.00
5-gallon	34	EACH	$21.00	$ 714.00	$714.00			$ 714.00
Fencing	1400	LINEAR FOOT	$1.50	$ 2,100.00	$2,100.00			$ 2,100.00
Soaker hose	150	LINEAR FOOT	$0.25	$ 37.50	$37.50			$ 37.50
Pump	1	EACH	$150.00	$ 150.00	$150.00			$ 150.00
			Sub-Total	$ 139,721.00	$ 10,271.00	$ 5,500.00	$ 123,950.00	$ 139,721.00
Equipment and Labor								

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

Montana Conservation Crew		contractor provided flat fee, work complet	$4,000.00	$ 4,000.00	-		4,000.00	$ 4,000.00
Sediment and erosion control		contractor provided flat fee, work complet	$3,500.00	$3,500.00	-		$3,500.00	$ 3,500.00
Sort and haul material		contractor provided flat fee, work complet	$5,500.00	$5,500.00	-		$5,500.00	$ 5,500.00
Backhoe	5	DAY	$1,000.00	$5,000.00		5,000.00		$ 5,000.00
Dump Truck	5	DAY	$700.00	$3,500.00		3,500.00		$ 3,500.00
1-gallon	5	EACH	$7.50	$ 37.50	37.50			$ 37.50
1-gallon tall	193	EACH	$10.00	$ 1,930.00	1,930.00			$ 1,930.00
2-gallon	56	EACH	$12.50	$ 700.00	700.00			$ 700.00
5-gallon	34	EACH	$26.25	$ 892.50	892.50			$ 892.50
Auger planting holes with mini-excavator	288	EACH	$2.50	$ 720.00	720.00			$ 720.00
Watering	40	HOUR	$35.00	$ 1,400.00	1,400.00			$ 1,400.00
Fencing	1400	LINEAR FOOT	$13.50	$ 18,900.00	-	9,450.00	9,450.00	$ 18,900.00
			Sub-Total	$ 46,080.00	$ 5,680.00	$ 17,950.00	$ 22,450.00	$ 46,080.00
Mobilization								
Mobilization/De mobiiization for Fall		contractor provided flat fee, work complet	$5,500.00	$ 5,500.00	-		5,500.00	$ 5,500.00
Planting - Spring	1	LUMP SUM	$500.00	$ 500.00	500.00			$ 500.00
Fencing- Spring	1	LUMP SUM	$500.00	$ 500.00	500.00			$ 500.00
Plant Delivery - Spring	1	LUMP SUM	$250.00	$ 250.00	250.00			$ 250.00
			Sub-Total	$ 6,750.00	$ 1,250.00	$ -	$ 5,500.00	$ 6,750.00
			TOTALS	$ 287,411.50	$ 23,655.00	$ 34,510.00	$ 229,246.50	$ 287,411.50

OTHER REQUIREMENTS:

All of the columns in the budget table and the matching contribution table MUST be completed appropriately or the application will be invalid. Please see the example budget sheet for additional clarification.

*Units = feet, hours, inches, etc. Do not use lump sum unless there is no other way to describe the costs.

**Can include in-kind materials. Justification for in-kind labor (e.g. hourly rates used for calculations). Describe here or in text.

Reminder: Government salaries cannot be used as in-kind match

***The Review Panel suggests that design and oversight costs associated with a proposed project not exceed 15% of the total project budget. If design and oversight costs are in excess of 15%, applications must include a minimum of two competitive bids for the cost of undertaking the project.

****The Review Panel recommends a maximum fencing cost of $1.50 per foot. Additional costs may be the responsibility of the applicant and/or partners.

MATCHING CONTRIBUTIONS (do not include requested funds)

CONTRIBUTOR	IN-KIND SERVICE	IN-KIND CASH	TOTAL	Secured? (Y/N)
Big Sky Professional Bull Riding Calcutta Proceeds	$ -	$ 6,430.00	$ 6,430.00	Y

BUDGET TEMPLATE SHEET FOR FUTURE FISHERIES PROGRAM APPLICATIONS

Custer Gallatin National Forest portion of outfitter fees	$ -	$ 21,739.00	$ 21,739.00	Y
2016 Gallatin Resource Advisory Committee Grant	$ -	$ 5,000.00	$ 5,000.00	Y
2016 Gallatin River Fly Fishing Festival Proceeds	$ -	$ 23,000.00	$ 23,000.00	Y
Individual Donations (11 contributors)	$ -	$ 53,618.00	$ 53,618.00	Y
Madison Gallatin Trout Unlimited	$ -	$ 5,000.00	$ 5,000.00	Y
Moonlight Community Foundation	$ -	$ 6,000.00	$ 6,000.00	Y
Patagonia World Trout Initiative	$ -	$ 15,000.00	$ 15,000.00	Y
Spanish Peaks Community Foundation	$ -	$ 5,100.00	$ 5,100.00	Y
Yellowstone Club Community Foundation	$ -	$ 25,000.00	$ 25,000.00	Y
Big Sky Rotary	$ -	$ 21,375.00	$ 21,375.00	N
Montana Trout Foundation	$ -	$ 11,000.00	$ 11,000.00	N
Individual Donations	$ -	$ 30,984.50	$ 30,984.50	N
US Forest Service Equipment	$ 8,500.00	$ -	$ 8,500.00	Y
US Forest Service Supplies	$ 1,800.00		$ 1,800.00	Y
Gallatin River Task Force Coordination	$ 11,060.00		$ 11,060.00	Y
Volunteer Labor	$ 13,150.00	$ -	$ 13,150.00	Y
TOTALS	$ 34,510.00	$ 229,246.50	$ 263,756.50	

Montana Department of Fish, Wildlife & Parks

Region 3 Headquarters 1400 S 9th Bozeman, MT 59718

November 21, 2017

Montana Fish, Wildlife & Parks
Fisheries Division
1420 E. Sixth Ave.
P.O. Box 200701
Helena, MT 59620-0701

Re: Moose Creek riparian restoration/protection project

To whom it may concern,

I wholeheartedly support efforts to minimize and mitigate for high use levels on the Gallatin River. The Gallatin River Task Force has partnered with the Forest Service to leverage dwindling infrastructure improvement funds. Currently, the Gallatin River supports healthy populations of wild trout. Conditions for cold-water species in the upper Gallatin River have historically been very good with predictably cold temperatures and adequate flows. Increased development in Big Sky and in Bozeman, as well as increased numbers of anglers and aquatic recreationists, will inevitably result in increased environmental impacts and stress on aquatic resources.

The Moose Creek project aims to control excessive riparian damage from uncontrolled and undesignated boat launches. Restoration of riparian plant communities and installation of fencing to protect those efforts is critical to reducing inputs of fine sediment and changes to the morphology of the Gallatin River.

Use levels for both anglers and other aquatic recreationists are not likely to decrease over the short or long term. Projects such as this, are key to responsibly providing river access and amenities to the angling and floating public. I hope you will consider this project for funding. If you have further questions regarding this effort and how it relates to trout populations, please feel free to contact me at (406) 994-6938.

Sincerely,

David C Moser
Fisheries Biologist

L&K
Ladd, Kulesza & Company

Real Estate Brokerage, Consulting & Development 406-995-2404 • LKREALESTATE.COM

Po Box 161236
Big Sky, MT 59716

November 29, 2017

Montana Fish, Wildlife & Parks
Fisheries Division
1420 E. Sixth Ave.
P.O. Box 200701
Helena, MT 59620-0701

Dear Montana Fish, Wildlife & Parks,

I am writing this letter in support of the Gallatin River Task Force application to fund their restoration project at Moose Creek. This is an extremely important project, which will reduce human impacts from river use, as well as improve safety and accessibility. The addition of designated access including a boat ramp and kayak launch, as well repairing previous environmental damage to the site is critical for the large amount of use that this site receives.

I appreciate your consideration of this project and encourage you to fully fund the request.

Best Regards,

Eric Ladd

GREATERYELLOWSTONE.ORG
LOCATIONS IN MONTANA, IDAHO & WYOMING

HEADQUARTERS
215 South Wallace Avenue
Bozeman, Montana 59715
406.586.1593

November 20, 2017

Fish & Wildlife Commission
Future Fisheries Improvement Program
Montana Fish, Wildlife & Parks
Fisheries Division
1420 E. Sixth Ave.
P.O. Box 200701
Helena, MT 59620-0701

Commissioners and Review Panel Members,

I am writing on behalf of the Greater Yellowstone Coalition, a regional ecological conservation and advocacy organization. For over 34 years we have supported programs that enhance, restore and protect aquatic resources. We promote natural processes and function where possible. In many cases human access and use of resources have had detrimental impacts to aquatic habitat and fisheries. In these cases we work on and encourage projects that best manage human interaction to minimize resource degradation.

The Greater Yellowstone Coalition fully supports the Gallatin River Task Force efforts to improve fisheries in the mainstem Gallatin River and specifically their Moose Creek project. It is essential for long term fisheries productivity that riparian buffers are protected and foot traffic is confined to limit impacts. The proposed streambank stabilization and floodplain revegetation will reduce stress to the native and wild trout that the Gallatin is so highly prized for.

We recognize the public benefit to wild fisheries and the broad range of interests that hold the Gallatin River as an exceptional resource. We encourage the Commission to fund the Moose Creek project to the highest level possible.

Sincerely,

Bob Zimmer
Waters Program Coordinator, Greater Yellowstone Coalition

American Rivers
Rivers Connect Us®

November 27, 2017

Montana Fish, Wildlife & Parks
Fisheries Division
1420 E. Sixth Ave.
P.O. Box 200701
Helena, MT 59620-0701

Re: Letter of Support for Moose Creek Project

To Whom It May Concern:

On behalf of American Rivers, it is my pleasure to submit this letter of support for the Gallatin River Task Force's application to receive Future Fisheries Improvement Program funding for the Moose Creek restoration project in the Gallatin River Canyon.

American Rivers' mission is to protect wild rivers, restore damaged rivers, and conserve clean water for people and nature. Since 1973, American Rivers has protected and restored more than 150,000 miles of rivers through advocacy efforts, on-the-ground projects, and an annual America's Most Endangered Rivers® campaign. Headquartered in Washington, DC, American Rivers has offices across the country and more than 275,000 members, supporters and volunteers. Our Northern Rockies office has been based in Bozeman since 2009.

We strongly support the Gallatin River Task Force's partnership with the US Forest Service to repair damaged streambanks and riparian areas at the Moose Creek access site and other badly degraded access sites in the Gallatin River Canyon. By restoring and improving the Moose Creek access site, the general public will benefit directly and two goals of the Future Fisheries Improvement Program will be achieved – restoring naturally functioning stream channels or banks; and restoring or protecting naturally functioning riparian areas. Both of these goals will aid wild trout in the Gallatin River.

We have worked closely with the Gallatin River Task Force on several projects over the past eight years and can attest to their staff's professionalism, the organization's overall effectiveness, and the tremendous support they enjoy from a broad range of stakeholders in the Gallatin River watershed. It is for these reasons that we give our enthusiastic support for the Moose Creek Project.

Sincerely,

Scott Bosse
Northern Rockies Director

Jeff Dunn
70 Meriwether
Bozeman, MT 59718

November 20, 2017

Montana Fish, Wildlife & Parks
Fisheries Division
1420 E. Sixth Ave.
P.O. Box 200701
Helena, MT 59620-0701

Re: Moose Creek Flat River Access Improvement Project Future Fisheries Grant Request

Dear Montana Fish, Wildlife and Parks:

I am writing to express my strong support for the Gallatin River Task Force's request for funding to implement the Moose Creek Flat River Access Improvement Project. As a long-time whitewater kayaker and fly fisher on the Gallatin River, I support the Gallatin River Task Force's efforts to develop designated river access sites and restore riparian areas and streambanks that have been damaged due to unmanaged river access. This project provides for riparian enhancements and streambank restoration that will improve streamside shading, decrease water temperatures, and reduce sediment loads to the Gallatin River. Support for this project is a meaningful steep in creating an educated and engaged river community that will promote the long-term stewardship of the Gallatin River.

Sincerely,

Jeff Dunn

November 20, 2017

Fish & Wildlife Commission
Future Fisheries Improvement Program
Montana Fish, Wildlife & Parks
Fisheries Division
1420 E. Sixth Ave.
P.O. Box 200701
Helena, MT 59620-0701

Dear Commissioners and Review Panel Members,

I am writing on behalf of the Madison Gallatin Trout Unlimited Chapter to express our support of the Moose Creek restoration project to restore streambanks and improve and protect riparian and fisheries health along the Upper Gallatin River.

It is work like this that we fully support and aim to engage in with partners like Gallatin River Task Force and others. MGTU's purpose is to conserve protect and restore Southwest Montana's Coldwater Fisheries and this is a perfect example of that work with improvements for streambanks, vegetation, and education on river ecology and aquatic invasive species.

Please accept this as our endorsement of the project and if you have further questions for us, please contact us via our information below

Sincerely,

Kris Kumlien
President
Madison-Gallatin Trout Unlimited
mgtroutunlimited@gmail.com
406-219-7691

November 30, 2017

Montana Fish, Wildlife and Parks Fisheries Division

Greetings,

I am writing this letter today in support for the work the Gallatin River Task Force is doing in and around Moose Creek Campground in the Gallatin Canyon. Not only am I a longtime user of the Gallatin River and the Moose Creek Campground for 15 years I have made my living from the Gallatin River and its amazing fishery.

Over the years I have used that campground for personal fishing, for fly fishing clientele and more recently it has become a great access to fish with my now 18 month old daughter. Although it is already a great access point it was in need of some love to not only protect the resource, but to make it more user friendly for the campers, whitewater rafters, kayakers, fishers and sight seers.

I am impressed with the work the Gallatin River Task Force has done to improve this sight and hope they can earn your support in their current and future efforts. There are many more sights along the Gallatin that are in need off attention.

Thank You,

Jimmy Armijo-Grover

General Manager Gallatin River Guides

Jimmy Armijo-Grover
Big SkyError! Bookmark not defined., MT59716
Phone: 406-995-2290 E-Mail: Armijo.jimmy@gmail.com

Moose Creek restoration [ADDL FULL DESIGN SHEETS AND REPORTS AVAILABLE]

USDA United States Department of Agriculture | Forest Service | Custer Gallatin National Forest | Bozeman Ranger District
3710 Fallon St., Suite C
Bozeman, MT 59718
406-522-2520

File Code: 2320/2530
Date: November 16, 2017

Montana Fish, Wildlife & Parks
Fisheries Division
1420 E. Sixth Ave.
P.O. Box 200701
Helena, MT 59620-0701

Dear Committee,

I am writing to express the our strong support for the Gallatin River Task Force's grant application for support Moose Flat Day Use Area river access improvement and stream bank restoration project. As you know, a healthy and accessible Gallatin River is an unmeasurable resource for residents and visitors of Big Sky.

Project Information
The Moose Creek project will be the first of many restoration projects that the Task Force is planning with the forest service to reduce human impacts from river use and improve accessibility and safety. Specifically, we will be repairing eroded streambanks, trampled riparian vegetation, and excessive unorganized trails to the river that contribute fine sediment by developing designated access sites for all user types, enhancing streamside vegetation, adding riparian fencing where necessary, improving trail systems, and stabilizing streambanks with bio-engineering techniques. Measureable outcomes of the Moose Creek project include:

1. 723 ft. of streambank stabilization using bioengineering techniques
2. 8,177 sq. ft. floodplain vegetation plantings
3. 855 ft of trails
4. boat ramp
5. repair old bridge abutment with addition of rock terrace stairway to the river
6. kayak launch
7. 450 ft. of riparian fencing, and
8. an educational interpretive sign about river ecology, minimizing human impact, and aquatic invasive species.

The Bozeman Ranger District and the Gallatin River Task Force have developed a partnership to jointly work on projects benefiting the watershed health of the Gallatin River watershed. The Custer Gallatin National Forest, Bozeman Ranger District, is responsible for the management of the Gallatin River watershed on National Forest lands. These responsibilities include the protection and management of natural and cultural resources, providing for safe and enjoyable public recreation and access, public health and safety, maintaining recreation sites, trails, and public infrastructure, and providing information and environmental education.

I am excited and optimistic about the our partnership with the Gallatin River Task Force since it will allow the Bozeman Ranger District to expand opportunities for watershed and recreational improvements within the Gallatin River watershed. The Gallatin River Task Force's considerable

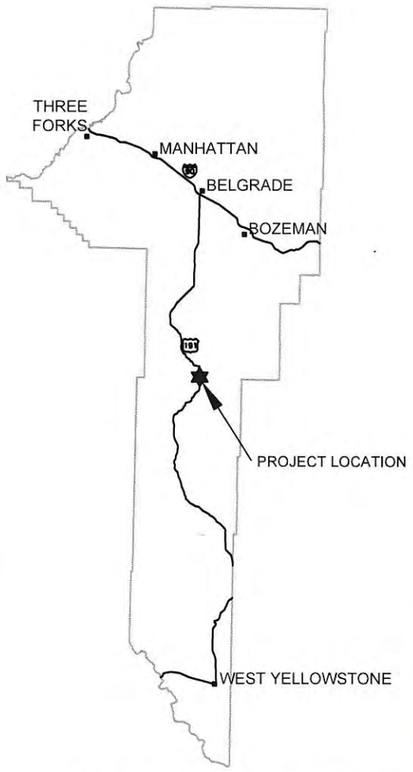
experience providing watershed education, water quality monitoring, and implementing watershed improvement projects is a valuable contribution to conservation efforts in the Gallatin River watershed.

Sincerely,

For TERI SETH
District Ranger

MOOSE CREEK FLAT
RIVER ACCESS IMPROVEMENT - PHASE 1

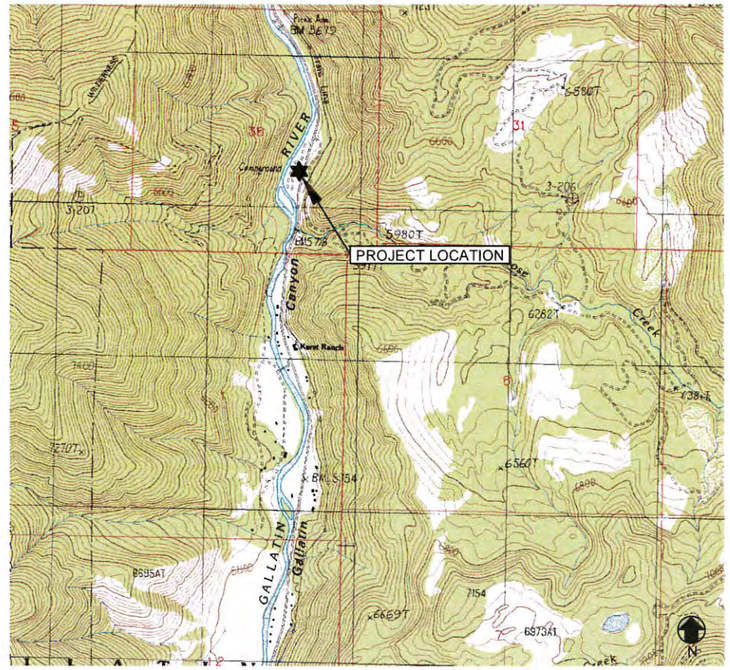
GALLATIN RIVER TASK FORCE
JANUARY 2017
RESPEC PROJECT NO. 02870



GALLATIN COUNTY, MONTANA
N.T.S.

SHEET INDEX

1	COVER SHEET
2	GENERAL NOTES AND SITE OVERVIEW
3	EXISTING SITE CONDITIONS
4	OVERVIEW OF PROPOSED TREATMENTS
5	PROPOSED GRADING - ROCK TERRACE RIVER ACCESS
6	ROCK TERRACE PROFILE
7	ROCK TERRACE STAIR PROFILE AND ESTIMATED QUANTITIES
8	ROCK TERRACE AND STAIR DETAIL
9	PROPOSED GRADING - BOAT RAMP AND KAYAK LAUNCH
10	BOAT RAMP AND KAYAK LAUNCH CENTERLINE PROFILE AND ESTIMATED MATERIAL QUANTITIES
11	BOAT RAMP DETAILS
12	KAYAK LAUNCH AND TRAIL DETAILS
13	SEDIMENT/EROSION CONTROL AND REVEGETATION PLAN



VICINITY MAP
N.T.S.

REVIEWED: _____ 2/1/2017
FOREST ENGINEER — DATE

APPROVED: _____ 2/2/17
DISTRICT RANGER — DATE

MONTANA
MATTHEW WYNN JOHNSON
No. 32820PE
2/2/17
LICENSED PROFESSIONAL ENGINEER

_____ 2/2/17
MATTHEW WYNN JOHNSON — DATE
REGISTERED PROFESSIONAL ENGINEER
STATE OF MONTANA NO. PEL-PE-LIC-32820

RESPEC
WATER & NATURAL RESOURCES
3810 VALLEY COMMONS DR
SUITE 4
BOZEMAN, MT 59718
PHONE (406) 284-2525

REVISION

DESIGNED JD/MJ/MR
DRAWN JR
CHECKED JD/MJ/MR
DATE 01/2017

STAMP

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GALLATIN RIVER TASK FORCE
PO BOX 160513
BIG SKY, MT 59716

MOOSE CREEK FLAT RIVER ACCESS IMPROVEMENT - PHASE 1

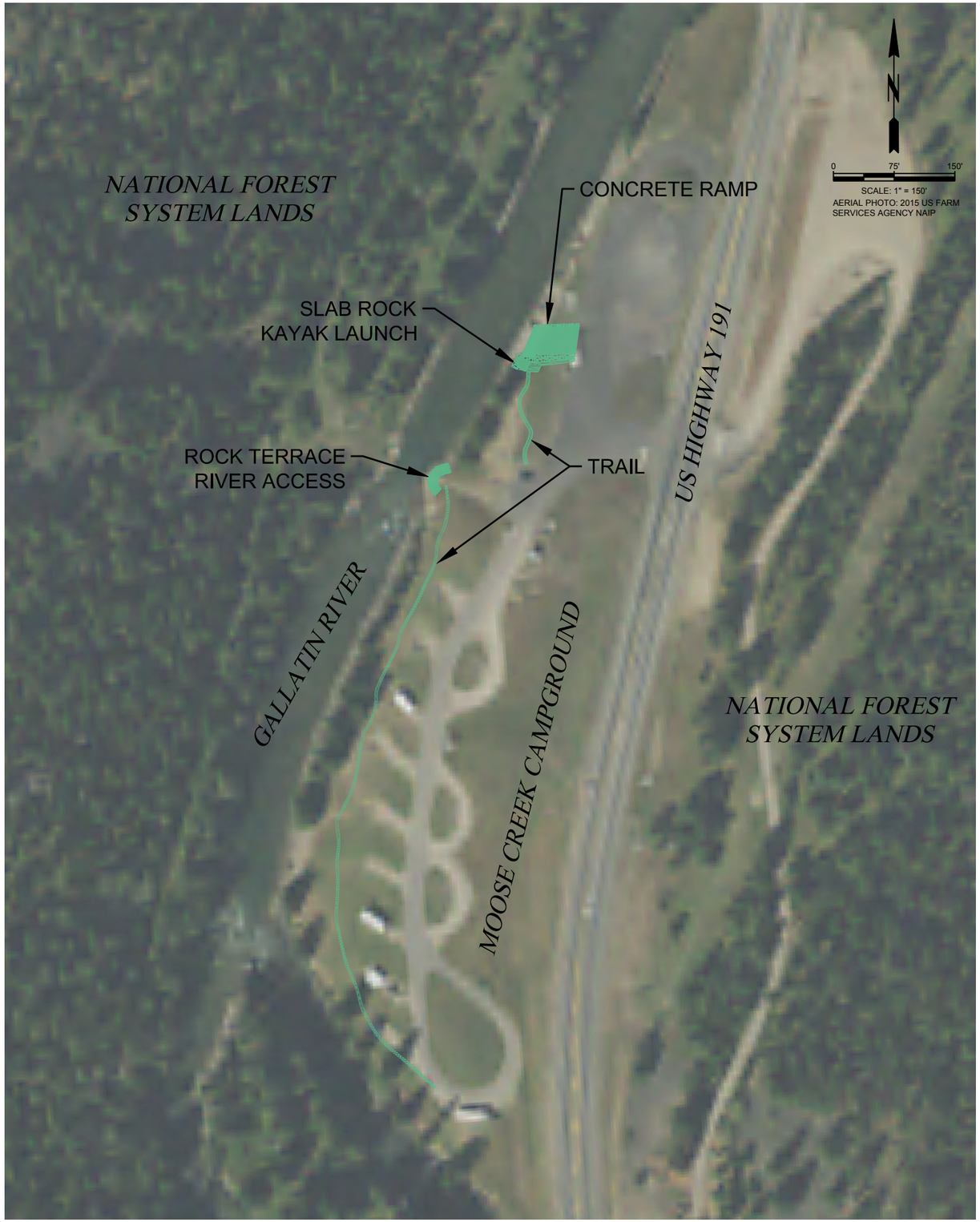
COVER SHEET

SHEET NUMBER: 1
SHEET 1

NAME: Z:\RESPEC\02870 - GALLATIN RIVER ACCESS SITES\CAD\SHEETS\02605_S_COVER_P1.DWG
PLOT DATE: January 11, 2017 2:18 PM, BY: JUDY ROSENBAUM

GENERAL NOTES:

1. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AND DETERMINE LOCATION OF ALL UNDERGROUND UTILITIES BEFORE COMMENCING WORK. **CALL 811** (OR ONE CALL UTILITY LOCATE: 1-800-424-5555) A MINIMUM OF 72-HOURS BEFORE WORK IS PLANNED. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND PROPERLY REPAIRING ANY AND ALL DAMAGED UTILITIES.
2. ANY UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. ALL UTILITY LOCATIONS ARE SUBJECT TO THE ACCURACY OF THE LOCATION METHOD AND SUBJECT TO RELOCATION FROM THE TIME THAT THESE DRAWINGS WERE PREPARED.
3. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY CONFLICTS FOUND BETWEEN THE CONSTRUCTION PLANS AND CONDITIONS ENCOUNTERED IN THE FIELD.
4. CONTRACTOR SHALL, UNLESS OTHERWISE DIRECTED, REPLACE ALL SIGNS, FENCES, CABLES, APPROACH DELINEATORS, OR OTHER FEATURES THAT MAY BE REMOVED TO ACCESS THE CONSTRUCTION AREA. CONTRACTOR SHALL VERIFY THE NATURE AND EXTENT OF ANY OF THESE FEATURES PRIOR TO BIDDING THE WORK. COST OF THIS WORK SHALL BE INCIDENTAL TO THE PROJECT UNLESS OTHERWISE STATED IN THE CONTRACT DOCUMENTS.
5. CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND RESTRICTIONS FOUND IN REGULATORY PERMITS OBTAINED BY THE ENGINEER/PLANNER.
6. LEGAL LOAD LIMIT REQUIREMENTS SHALL BE ADHERED TO ON ALL STATE HIGHWAYS, COUNTY ROADS, AND CITY STREETS.
7. THE CONTRACTOR IS TO PROVIDE HIS OWN WATER FOR COMPACTION AND DUST ABATEMENT.
8. CONSTRUCTION SHALL COMPLY WITH THESE PLANS IN ADDITION TO THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
9. QUANTITY ESTIMATES PROVIDED FOR GUIDANCE PURPOSES AND SHOULD NOT BE USED TO BASE PRICING.
10. ALL NEW RIPRAP TO CONFORM TO MONTANA DEPARTMENT OF TRANSPORTATION 701.06 - CLASS II RANDOM RIPRAP. ALL IMPORTED RIPRAP TO BE OBTAINED AT USFS CASCADE QUARRY PIT LOCATED BETWEEN MILE MARKERS 60 AND 61 OF US HIGHWAY 191, FURNISHED BY THE USFS AT NO COST TO CONTRACTOR. RIPRAP MUST BE SORTED TO CONFORM TO SPECIFICATIONS, LOADED AND HAULED TO SITE, AND PLACED ACCORDING TO THE DRAWINGS AT THE EXPENSE OF THE CONTRACTOR.
11. APPROXIMATELY 315 CY OF EXCAVATION AND GRADING ARE ESTIMATED FOR BOAT RAMP AND SLAB ROCK KAYAK LAUNCH. APPROXIMATELY 30 CY OF EXCAVATED MATERIAL MAY BE USED AS EMBANKMENT FILL FOR ROCK TERRACE RIVER ACCESS.
12. APPROXIMATELY 285 CY OF EXCAVATED MATERIAL TO BE HAULED TO USFS CASCADE QUARRY PIT LOCATED BETWEEN MILE MARKERS 60 AND 61 OF US HIGHWAY 191 AND SORTED INTO TWO STOCKPILES - SUITABLE FINES AND UNSUITABLE COARSE/COBBLE.
13. DEWATERING ACTIVITIES MAY BE REQUIRED FOR CONSTRUCTION. CONSTRUCTION CONTRACTOR IS RESPONSIBLE FOR OBTAINING A UNITED STATED ARMY CORPS OF ENGINEERS NATIONWIDE PERMIT 33 TEMPORARY CONSTRUCTION, ACCESS AND DEWATERING PERMIT, ALONG WITH ANY OTHER RELEVANT PERMITS REQUIRED FOR CONSTRUCTION DEWATERING.



RESPEC
WATER & NATURAL RESOURCES
3810 VALLEY COMMONS DR.
SUITE 4
BOZEMAN, MT 59718
PHONE (406) 284-2525

REVISION

DESIGNED	JD/MJ/MR
DRAWN	JR
CHECKED	JD/MJ/MR
DATE	01/2017

STAMP

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GALLATIN RIVER TASK FORCE
PO BOX 160513
BIG SKY, MT 59716

MOOSE CREEK FLAT RIVER ACCESS IMPROVEMENT - PHASE 1

GENERAL NOTES AND SITE OVERVIEW

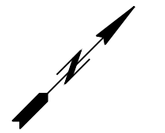
SHEET NUMBER: 2

SHEET 2

NAME: Z:\RESPEC\02870 - GALLATIN RIVER ACCESS SITES\CAD\SHEETS\02805_S_COVER_P1.DWG
PLOT DATE: January 23, 2017 10:44 AM, BY: JUDY ROSENBAUM

COORDINATES OF CONTROL POINTS (ALL COORDINATES ARE LOCAL)

POINT	NORTHING	EASTING	ELEVATION
CONTROL PT. #102	20183.210	40143.040	97.950
CONTROL PT. #103	19944.570	40098.060	102.290
CONTROL PT. #116	19664.040	40096.750	115.440

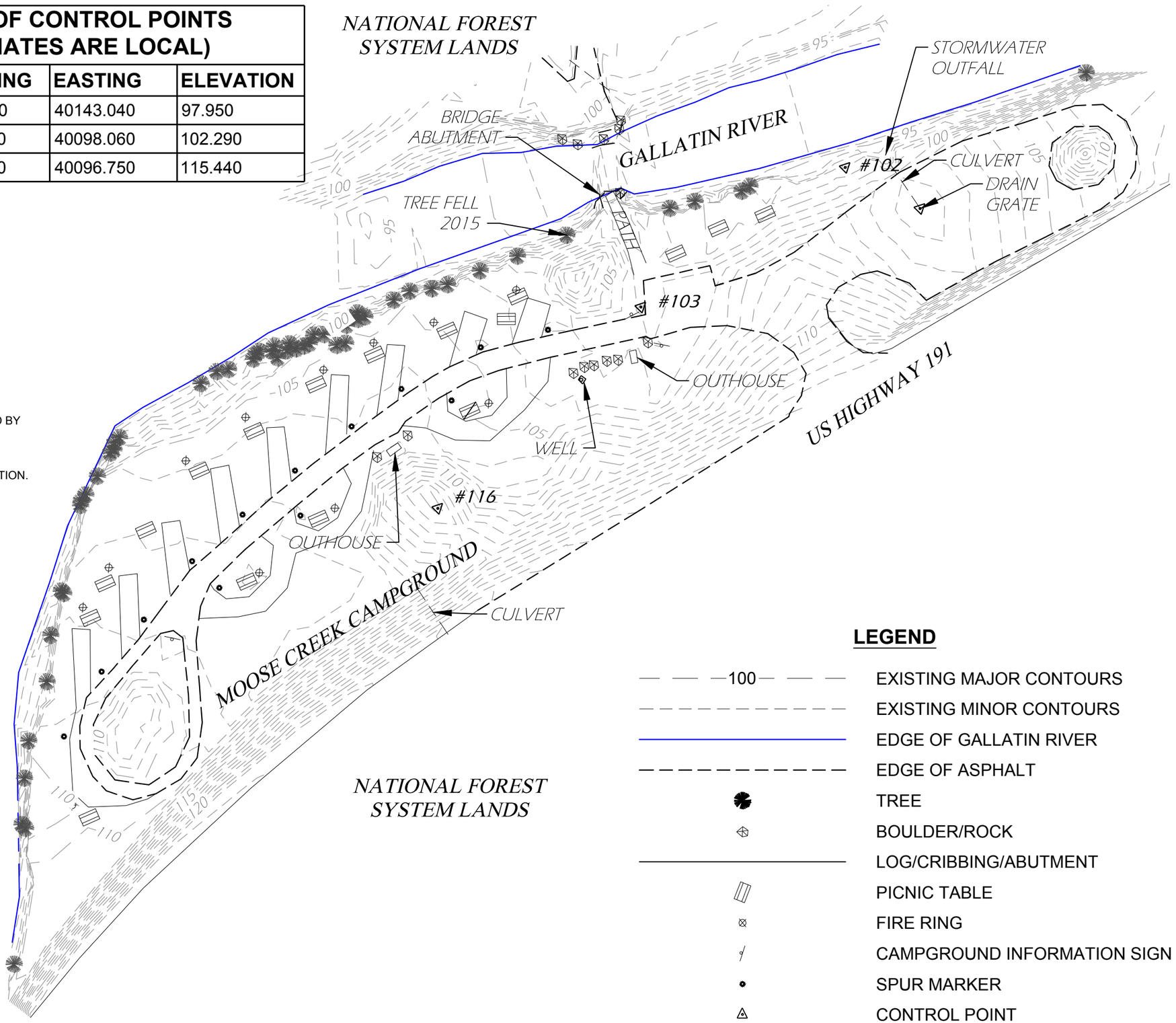


0 50' 100'

SCALE: 1" = 100'

BASIS OF BEARING:
COMPASS AZIMUTH;
USING 15° DECLINATION

NOTES:
1. TOPOGRAPHIC SURVEY PERFORMED BY USFS ON 10/14/2014 AND 11/19/2014.
2. CONTOURS AND BANK LOCATIONS SHOWN MAY NOT MATCH EXISTING CONDITIONS AT TIME OF CONSTRUCTION.



LEGEND

- EXISTING MAJOR CONTOURS (100)
- EXISTING MINOR CONTOURS
- EDGE OF GALLATIN RIVER
- EDGE OF ASPHALT
- TREE
- BOULDER/ROCK
- LOG/CRIBBING/ABUTMENT
- PICNIC TABLE
- FIRE RING
- CAMPGROUND INFORMATION SIGN
- SPUR MARKER
- CONTROL POINT

RESPEC
WATER & NATURAL RESOURCES
3810 VALLEY COMMONS DR.
SUITE 4
BOZEMAN, MT 59718
PHONE (406) 284-2525

REVISION

DESIGNED JD/MJ/MR
DRAWN JR
CHECKED JD/MJ/MR
DATE 01/2017

STAMP

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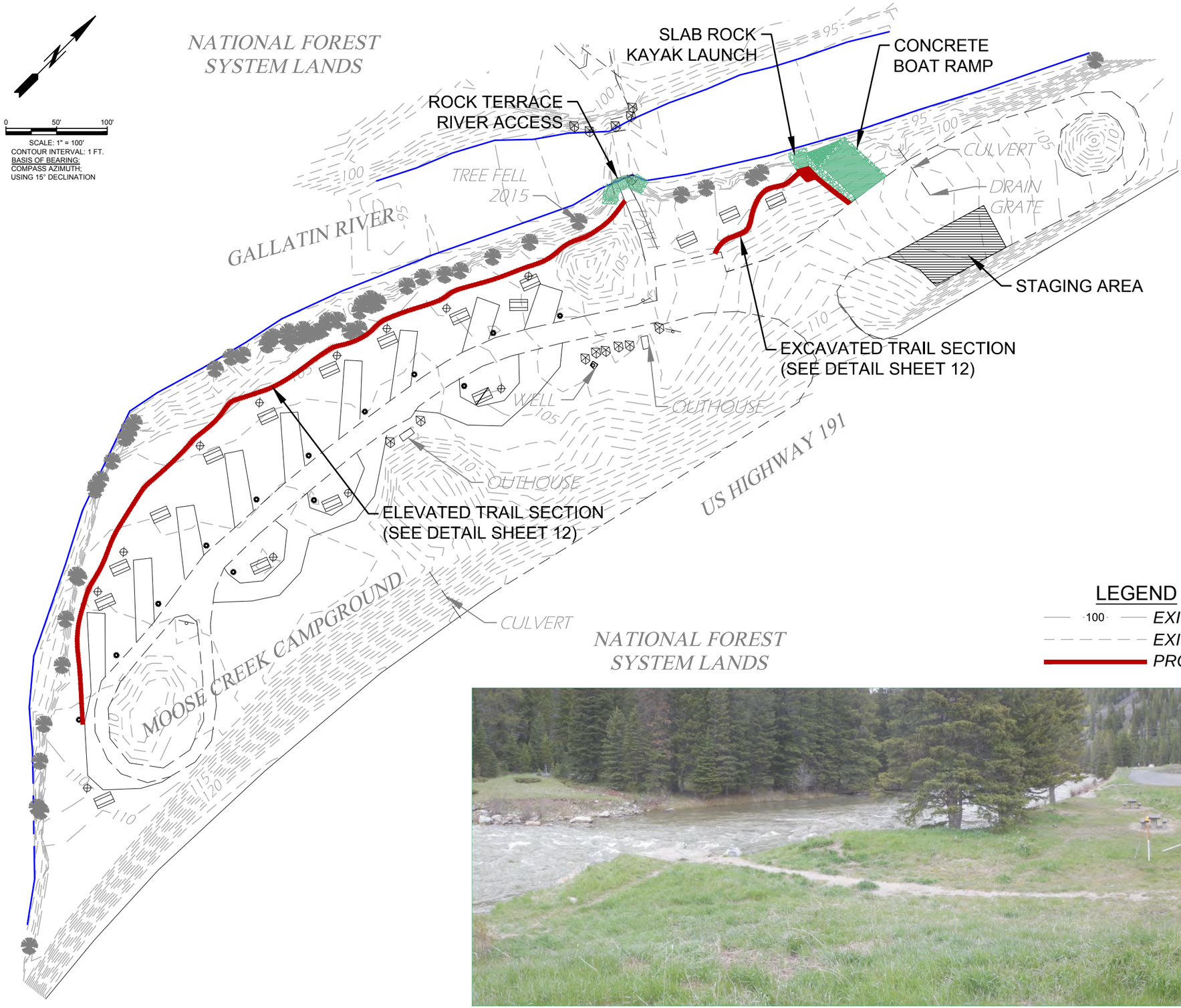
PO BOX 160513
BIG SKY, MT 59716

MOOSE CREEK FLAT RIVER ACCESS IMPROVEMENT - PHASE 1

EXISTING SITE CONDITIONS

SHEET NUMBER: 3
SHEET 3

NAME: Z:\RESPEC\02870 - GALLATIN RIVER ACCESS SITES\CAD\SHEETS\02605_S_EXISTING.DWG
PLOT DATE: January 12, 2017 10:53 AM, BY: JUDY ROSENBAUM



LEGEND

100 EXISTING MAJOR CONTOUR

EXISTING MINOR CONTOUR

PROPOSED TRAIL ALIGNMENT

NAME: Z:\RESPEC\02870 - GALLATIN RIVER ACCESS SITES\CAD\SHEETS\02605_S_TRAILS.DWG
PLOT DATE: January 17, 2017 5:40 PM, BY: JUDY ROSENBAUM

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WATER & NATURAL RESOURCES
3810 VALLEY COMMONS DR.
SUITE 4
BOZEMAN, MT 59718
PHONE (406) 284-2525

REVISION

DESIGNED	JD/MJ/MR	
DRAWN	JR	
CHECKED	JD/MJ/MR	
DATE	01/2017	

STAMP

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BIG SKY, MT 59716

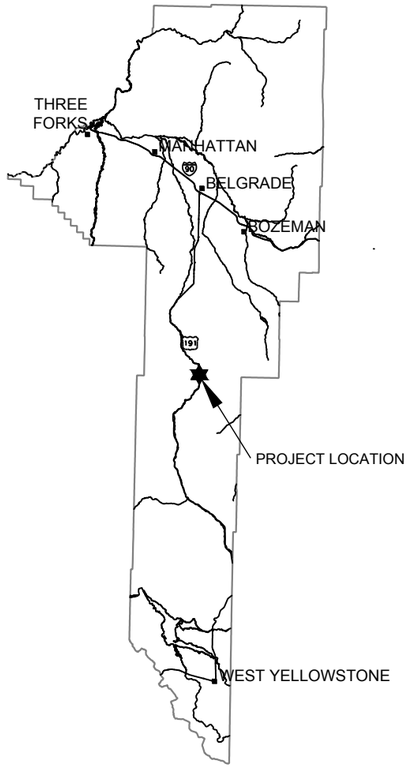
MOOSE CREEK FLAT
RIVER ACCESS
IMPROVEMENT -
PHASE 1

OVERVIEW OF
PROPOSED
TREATMENTS

SHEET NUMBER:
4
SHEET 4

MOOSE CREEK FLAT
RIVER ACCESS IMPROVEMENT - PHASE 2

GALLATIN RIVER TASK FORCE
OCTOBER 2017
SITE 2 STREAMBANK BIOENGINEERING, SCHEDULE 1 - FINAL DESIGN
RIPARIAN PLANTING, SCHEDULE 2 - 90% COMPLETE
RESPEC PROJECT NO. 02870



GALLATIN COUNTY, MONTANA
N.T.S.

SHEET INDEX

1	COVER SHEET
2	GENERAL NOTES AND SITE OVERVIEW
3	SUMMARY OF QUANTITIES
4	EXISTING SITE CONDITIONS
5	OVERVIEW OF PROPOSED TREATMENTS
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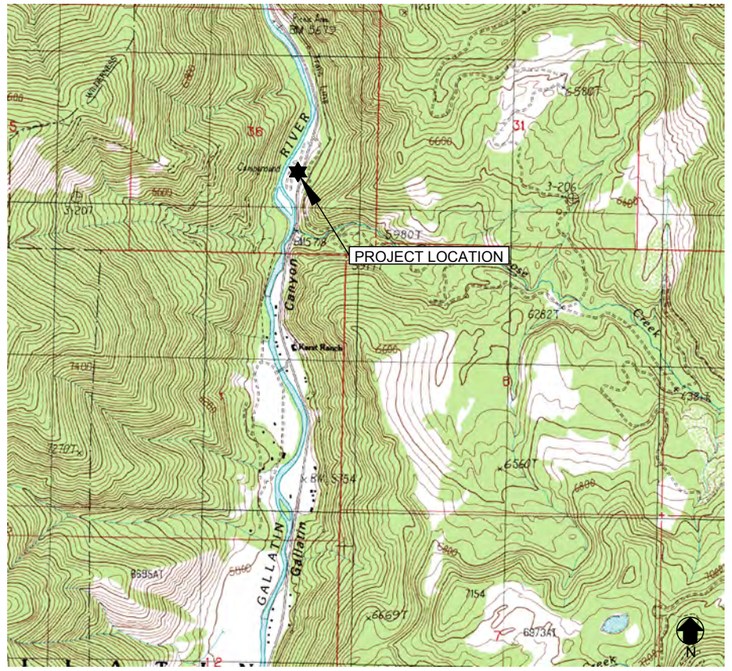
8 - 10	SITE 2 - PLAN AND SECTIONS
11 - 12	SITE 3 - PLAN AND SECTIONS
13 - 15	SITE 4 - PLAN AND SECTIONS
16 - 17	SITE 5 - PLAN AND SECTIONS
18 - 19	TYPICAL DETAILS
20 - 21	PLANTING NOTES
22	SEDIMINTATION/EROSION CONTROL AND REVEGETATION PLAN
	POST AND RAIL FENCE DETAIL - USDA FOREST SERVICE STANDARD TRAIL PLAN



VICINITY MAP
N.T.S.

REVIEWED:

FOREST ENGINEER _____ DATE _____

APPROVED:

DISTRICT RANGER _____ DATE _____

MATTHEW WYNN JOHNSON
REGISTERED PROFESSIONAL ENGINEER
STATE OF MONTANA NO. PEL-PE-LIC-32820 _____ DATE _____

RESPEC

NAME: S:\PROJECTS\02870 - GRTF - MOOSE FLAT\CAD\SHEETS\02605_S_COVER_P2.DWG
PLOT DATE: October 10, 2017 10:53 AM, BY: LIBBY ELLWOOD

3810 VALLEY COMMONS DR.
SUITE 4
BOZEMAN, MT 59718
PHONE (406) 284-2525

DESIGNED	JD/MJ/MR	
DRAWN	JR	
CHECKED	JD/MJ/MR	
DATE	10/2017	

REVISION

RESPEC

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PO BOX 160513
BIG SKY, MT 59716

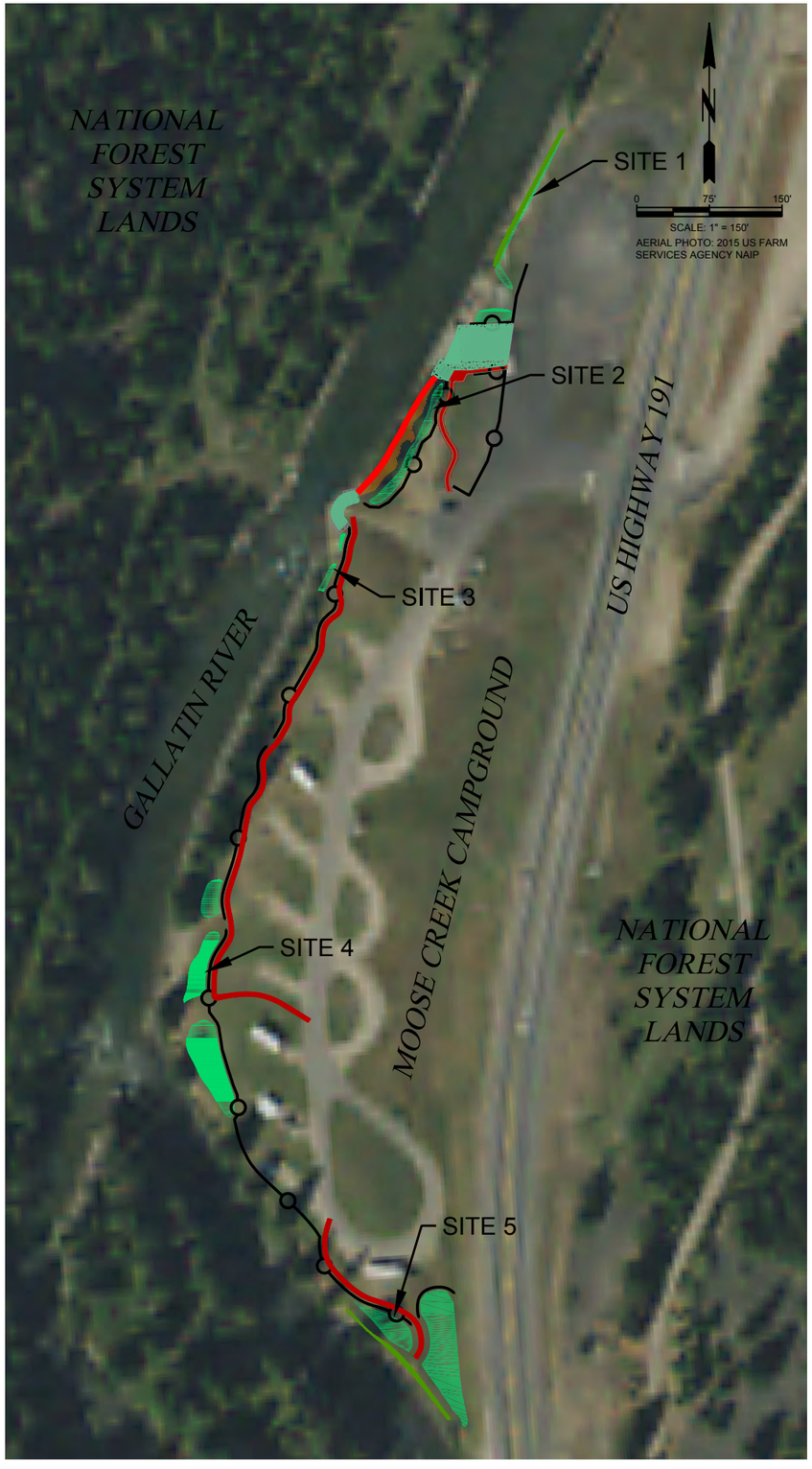
MOOSE CREEK FLAT
RIVER ACCESS
IMPROVEMENT -
PHASE 2

COVER SHEET

SHEET NUMBER:
1
SHEET 1

GENERAL NOTES:

1. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AND DETERMINE LOCATION OF ALL UNDERGROUND UTILITIES BEFORE COMMENCING WORK. **CALL 811** (OR ONE CALL UTILITY LOCATE: 1-800-424-5555) A MINIMUM OF 72-HOURS BEFORE WORK IS PLANNED. CONTRACTOR IS RESPONSIBLE FOR PROTECTING AND PROPERLY REPAIRING ANY AND ALL DAMAGED UTILITIES.
2. ANY UTILITY LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. ALL UTILITY LOCATIONS ARE SUBJECT TO THE ACCURACY OF THE LOCATION METHOD AND SUBJECT TO RELOCATION FROM THE TIME THAT THESE DRAWINGS WERE PREPARED.
3. THE CONTRACTOR SHALL HAVE ONE (1) SIGNED COPY OF THE APPROVED PLANS AND A COPY OF ANY PERMITS AND EXTENSION AGREEMENTS NEEDED FOR THE JOB, ON-SITE AT ALL TIMES.
4. 4. THE CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF ALL PERSONNEL, ALL SITE VISITORS, AND THE GENERAL PUBLIC WHO MAY BE AFFECTED BY THE CONSTRUCTION. THIS INCLUDES BUT IS NOT LIMITED TO GENERAL AND CHANNEL EXCAVATION, SHORING, TRAFFIC CONTROL, AND SECURITY.
5. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY CONFLICTS FOUND BETWEEN THE CONSTRUCTION PLANS AND CONDITIONS ENCOUNTERED IN THE FIELD.
6. CONTRACTOR SHALL, UNLESS OTHERWISE DIRECTED, REPLACE ALL SIGNS, FENCES, CABLES, APPROACH DELINEATORS, OR OTHER FEATURES THAT MAY BE REMOVED TO ACCESS THE CONSTRUCTION AREA. CONTRACTOR SHALL VERIFY THE NATURE AND EXTENT OF ANY OF THESE FEATURES PRIOR TO BIDDING THE WORK. COST OF THIS WORK SHALL BE INCIDENTAL TO THE PROJECT UNLESS OTHERWISE STATED IN THE CONTRACT DOCUMENTS.
7. CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS AND RESTRICTIONS FOUND IN REGULATORY PERMITS OBTAINED BY THE ENGINEER.
8. LEGAL LOAD LIMIT REQUIREMENTS SHALL BE ADHERED TO ON ALL STATE HIGHWAYS, COUNTY ROADS, AND CITY STREETS.
9. THE CONTRACTOR IS TO PROVIDE HIS OWN WATER FOR COMPACTION AND DUST ABATEMENT.
10. CONSTRUCTION SHALL COMPLY WITH THESE PLANS IN ADDITION TO THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT USED ONSITE WILL BE CLEAN, WASHED PRIOR TO ARRIVAL TO THE PROJECT AREAS.
12. EMERGENCY SPILL KITS WILL BE MAINTAINED ON EACH PIECE OF EQUIPMENT, OR IN AN AREA THAT CAN RAPIDLY BE REACHED.
13. FOR INSTALLATION OF STREAMBANK TREATMENTS, ALL WORK WILL BE DONE DURING LOW FLOWS.
14. STRUCTURAL BMPS, SUCH AS SILT FENCE, STRAW BALES OR WATTLES WILL BE USED TO ISOLATE CONSTRUCTION ALONG THE ACTIVE CHANNEL AS NECESSARY.
15. ALL EXPOSED SOILS WILL BE STABILIZED ONCE CONSTRUCTION IS COMPLETED, SOILS WILL BE STABILIZED USING VARIOUS TECHNIQUES AS DESCRIBED IN THIS PLAN INCLUDING, SEEDING, SOD TRANSPLANT AND PLANTING.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAVING AND PROTECTING ALL EXISTING TREES AND VEGETATION WHERE REMOVAL FOR CONSTRUCTION IS NOT MANDATORY.
17. IF WOUNDING OF SAVED TREES OCCUR, A NON-TOXIC WOUND DRESSING MUST BE APPLIED IMMEDIATELY. EXCAVATORS MUST HAVE A NON-TOXIC TREE WOUND DRESSING WITH THEM ON CONSTRUCTION SITES.
18. ALL EXCAVATED MATERIALS FROM STREAMBANK WILL BE PLACED IN AN AREA APPROVED BY THE ENGINEER.
19. ALL REMOVED ITEMS SHALL BECOME THE CONTRACTOR'S PROPERTY TO BE DISPOSED OF IN AN APPROVED MANNER IN ACCORDANCE WITH REGULATION BY THE OWNER AT NO ADDITIONAL EXPENSE TO THE OWNERS, UNLESS SPECIFIED WITHIN THE PLANS. NO CONCRETE, RUBBLE, OR EXTRA MATERIALS SHALL BE BACKFILLED ON SITE.
20. MATERIAL STOCK PILE AREAS, ACCESS ROUTES, AND EQUIPMENT STORAGE AREAS WILL BE IDENTIFIED PRIOR TO THE ARRIVAL OF CONTRACTOR HEAVY EQUIPMENT.
21. MATERIALS STORED ON THE SITE WHICH MIGHT CONTRIBUTE POLLUTANTS TO RUNOFF SHALL BE LOCATED IN AN ENCLOSED, COVERED, AND LOCKABLE CONTAINER. THESE MATERIALS ARE EXPECTED TO CONSIST MAINLY OF FERTILIZERS, FUELS, AND MACHINERY LUBRICANTS.
22. ALL EXISTING AND PROPOSED CONTOURS ARE LABELED IN FEET AND REFERENCE THE 1988 VERTICAL DATUM. ALL SLOPES ARE SHOWN AS DIAGRAMMATIC AND SHALL BE ROUNDED AT THE TOP AND BOTTOM.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CLEANUP OF THE PROJECT SITE AND SURROUNDING AREAS ON A DAILY BASIS OF ANY TRASH OR MUD ON THE SITE OR ADJACENT CAMP SITES AS A RESULT OF CONSTRUCTION.
24. THE CONTRACTOR SHALL RESTORE ALL STAGING AND STOCKPILING AREAS TO THEIR ORIGINAL CONDITION OR BETTER THAN EXISTING UPON COMPLETION OF THE PROJECT. THE COST TO RESTORE THESE AREAS SHALL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE WORK.
25. THE CONTRACTOR SHALL MAINTAIN ALL HAUL ROUTES AND RESTORE THEM TO THEIR ORIGINAL CONDITION OR BETTER THAN EXISTING UPON COMPLETION OF USE AT NO EXPENSE TO THE OWNER.
26. ALL PAVED HAUL ROUTES SHALL BE MAINTAINED FREE OF MUD AND DEBRIS RESULTING FROM CONSTRUCTION OPERATIONS.
27. THE CONTRACTOR SHALL MINIMIZE TRAFFICKING AND DISTURBANCE TO CAMPGROUND.
28. CONTRACTOR IS RESPONSIBLE FOR REPAIRING/REPLACING ALL DAMAGED INFRASTRUCTURE.
29. THE CONTRACTOR SHALL NOT DEVIATE FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM ENGINEER.
30. THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
31. ALL ESTIMATES OF QUANTITIES SHALL BE VERIFIED BY THE CONTRACTOR/SUBCONTRACTOR, WHO SHALL BE RESPONSIBLE FOR DETERMINING ALL QUANTITIES AND PROVIDING THE WORK AND MATERIALS AS SHOWN ON THE PLANS.



3810 VALLEY COMMONS DR.
SUITE A
BOZEMAN, MT 59718
PHONE (406) 284-2525

	REVISION
DESIGNED JD/MJ/MR	
DRAWN JR	
CHECKED JD/MJ/MR	
DATE 10/2017	

RESPEC

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GALLATIN RIVER TASK FORCE
PO BOX 160513
BIG SKY, MT 59716

MOOSE CREEK FLAT
RIVER ACCESS
IMPROVEMENT -
PHASE 2

GENERAL NOTES AND
SITE OVERVIEW

SHEET NUMBER:
2
SHEET 2

NAME: S:\PROJECTS\02870 - GRTF - MOOSE FLAT\CAD\SHEETS\02605_S_COVER_P2.DWG
PLOT DATE: October 10, 2017 10:53 AM, BY: LIBBY ELLWOOD

SITE 1 - ADD WILLOWS USING STINGER AND SHRUB PLANTINGS	QUANTITY	UNIT	SCHEDULE
LIVE WILLOW CUTTINGS	160	EA	1
CONTAINERIZED PLANTINGS			
ENGELMANN SPRUCE - 2 GAL	3	EA	2
MOUNTAIN ALDER - 5 GAL	3	EA	2
WOLF WILLOW - 2 GAL	7	EA	2
WOODS ROSE - 1 GAL	5	EA	2

SITE 2 - STREAMBANK BIOENGINEERING	QUANTITY	UNIT	SCHEDULE
STREMBANK BIONEGINEERING			
LENGTH	145	FT	1
FILL (USE FILL GENERATED FROM RAMP CONSTRUCTION)	160	CUYD	1
GEOTEXTILE FABRIC - WOVEN COIR FABRIC - BioD70	161	SQYD	1
GEOTEXTILE FABRIC - NONWOVEN COI - BioOCF30	161	SQYD	1
TRIANGULAR STAKES	218	EA	1
BIODEGRADABLE TWINE (3/5" DIAMETER)	667	FT	1
STREAMBANK REVEGETATION MIX	0.04	AC	1
CONIFER BRUSH FASCINE	145	FT	1
LIVE WILLOW CUTTINGS	3,045	EA	1
CONTAINERIZED PLANTINGS			
BEBBS WILLOW - 5 GAL	12	EA	2
ENGELMANN SPRUCE - 2 GAL	3	EA	2
SANDBAR WILLOW - 5 GAL	33	EA	2
SHRUBBY CINQUEFOIL - TALL GAL	3	EA	2
SNOWBERRY - TALL GAL	12	EA	2
SUBALPINE FIR - 2 GAL	3	EA	2
WOLF WILLOW - 2 GAL	3	EA	2
WOODS ROSE - TALL GAL	8	EA	2

SITE 3 - ADD WILLOWS USING STINGER AND SHRUB PLANTINGS	QUANTITY	UNIT	SCHEDULE
CONTAINERIZED PLANTINGS			
MOUNTAIN ALDER - 5 GAL	3	EA	2
WOLF WILLOW - 2 GAL	8	EA	2

SITE 4 - CONIFER/SHRUB PLANTINGS	QUANTITY	UNIT	SCHEDULE
CONTAINERIZED PLANTINGS			
DOUGLAS FIR - 2 GAL	6	EA	2
ROCKY MOUNTAIN JUNIPER - 5 GAL	5	EA	2
SHRUBBY CINQUEFOIL - TALL GAL	3	EA	2
SNOWBERRY - TALL GAL	35	EA	2
SUBAPLINE FIR - 2 GAL	5	EA	2
WOODS ROSE - TALL GAL	31	EA	2

SITE 5 - ADD WILLOWS USING STINGER AND SHRUB PLANTINGS	QUANTITY	UNIT	SCHEDULE
LIVE WILLOW CUTTINGS	160	EA	1
CONTAINERIZED PLANTINGS			
DOUGLAS FIR - 2 GAL	4	EA	2
QUAKING ASPEN - TALL GAL	8	EA	2
ROCKY MOUNTAIN JUNIPER - 5 GAL	3	EA	2
SHRUBBY CINQUEFOIL - TALL GAL	2	EA	2
SNOWBERRY - TALL GAL	18	EA	2
SUBALPINE FIR - 2 GAL	3	EA	2
WOLF WILLOW - 2 GAL	3	EA	2
WOODS ROSE - TALL GAL	31	EA	2

SITE 1-5 - FENCING	QUANTITY	UNIT	SCHEDULE
POST AND RAIL FENCING	1,406	FT	3

CUYD = CUBIC YARD
EA = EACH
FT = LINEAR FOOT
SQFT = SQUARE FOOT
SQYD = SQUARE YARD

3810 VALLEY COMMONS DR.
SUITE 4
BOZEMAN, MT 59718
PHONE (406) 284-2525

DESIGNED JD/MJ/MR
DRAWN JR
CHECKED JD/MJ/MR
DATE 10/2017

REVISION

RESPEC

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GALLATIN RIVER TASK FORCE
PO BOX 160513
BIG SKY, MT 59716

MOOSE CREEK FLAT
RIVER ACCESS
IMPROVEMENT -
PHASE 2

SUMMARY OF QUANTITIES

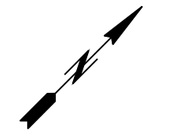
SHEET NUMBER: 3

SHEET 3

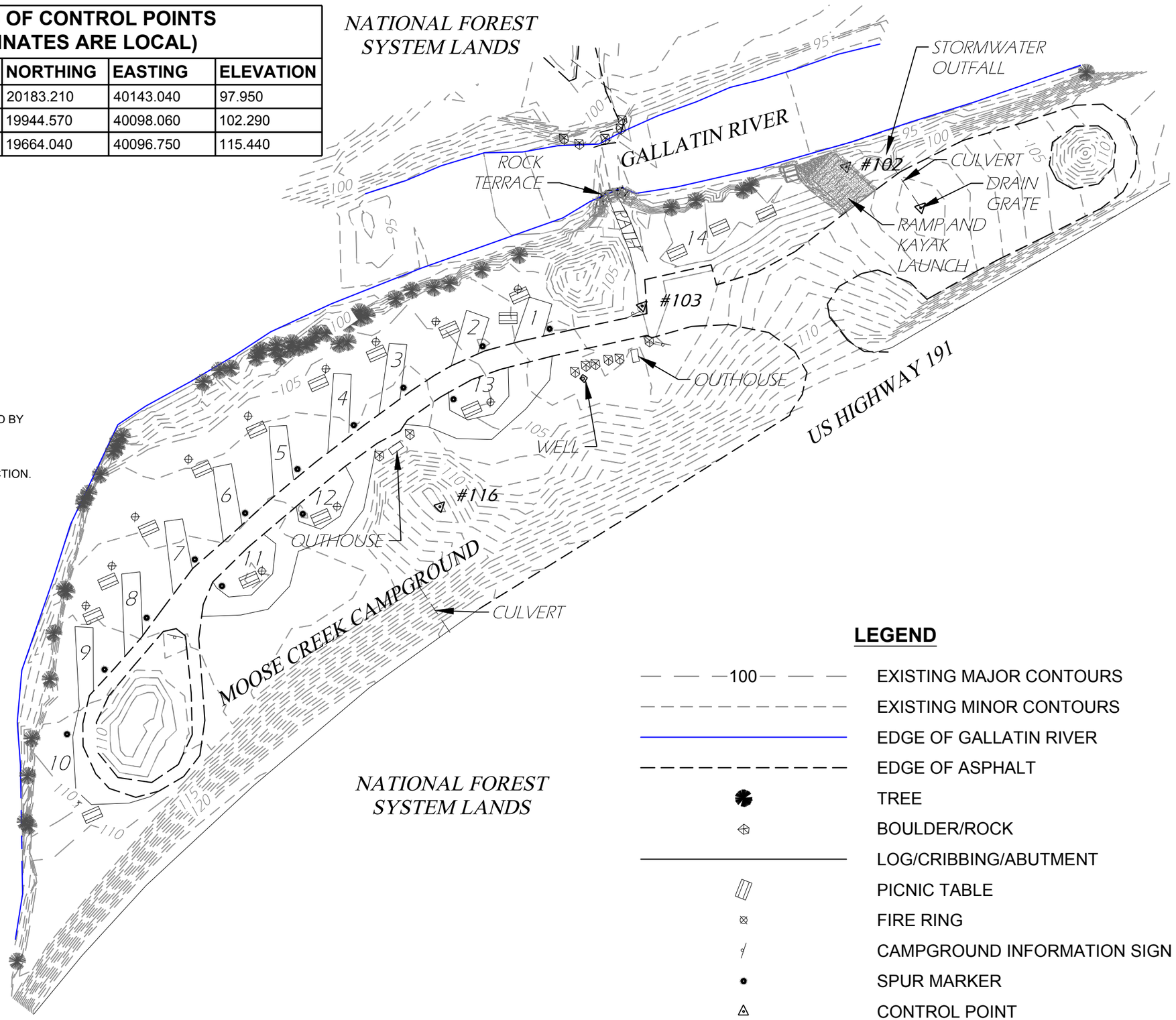
NAME: S:\PROJECTS\92870 - GRTF - MOOSE FLAT\CAD\SHEETS\02605_S_COVER_P2.DWG
PLOT DATE: October 10, 2017 10:53 AM, BY: LIBBY ELLWOOD

COORDINATES OF CONTROL POINTS (ALL COORDINATES ARE LOCAL)

POINT	NORTHING	EASTING	ELEVATION
CONTROL PT. #102 (OBLITERATED)	20183.210	40143.040	97.950
CONTROL PT. #103	19944.570	40098.060	102.290
CONTROL PT. #116	19664.040	40096.750	115.440



NOTES:
1. TOPOGRAPHIC SURVEY PERFORMED BY USFS ON 10/14/2014 AND 11/19/2014.
2. CONTOURS AND BANK LOCATIONS SHOWN MAY NOT MATCH EXISTING CONDITIONS AT TIME OF CONSTRUCTION.



LEGEND

- EXISTING MAJOR CONTOURS (100)
- EXISTING MINOR CONTOURS
- EDGE OF GALLATIN RIVER
- EDGE OF ASPHALT
- TREE
- BOULDER/ROCK
- LOG/CRIBBING/ABUTMENT
- PICNIC TABLE
- FIRE RING
- CAMPGROUND INFORMATION SIGN
- SPUR MARKER
- CONTROL POINT

DESIGNED JD/MJ/MR
DRAWN JR
CHECKED JD/MJ/MR
DATE 10/2017

3810 VALLEY COMMONS DR. SUITE B
BOZEMAN, MT 59718
PHONE (406) 284-2525

REVISION

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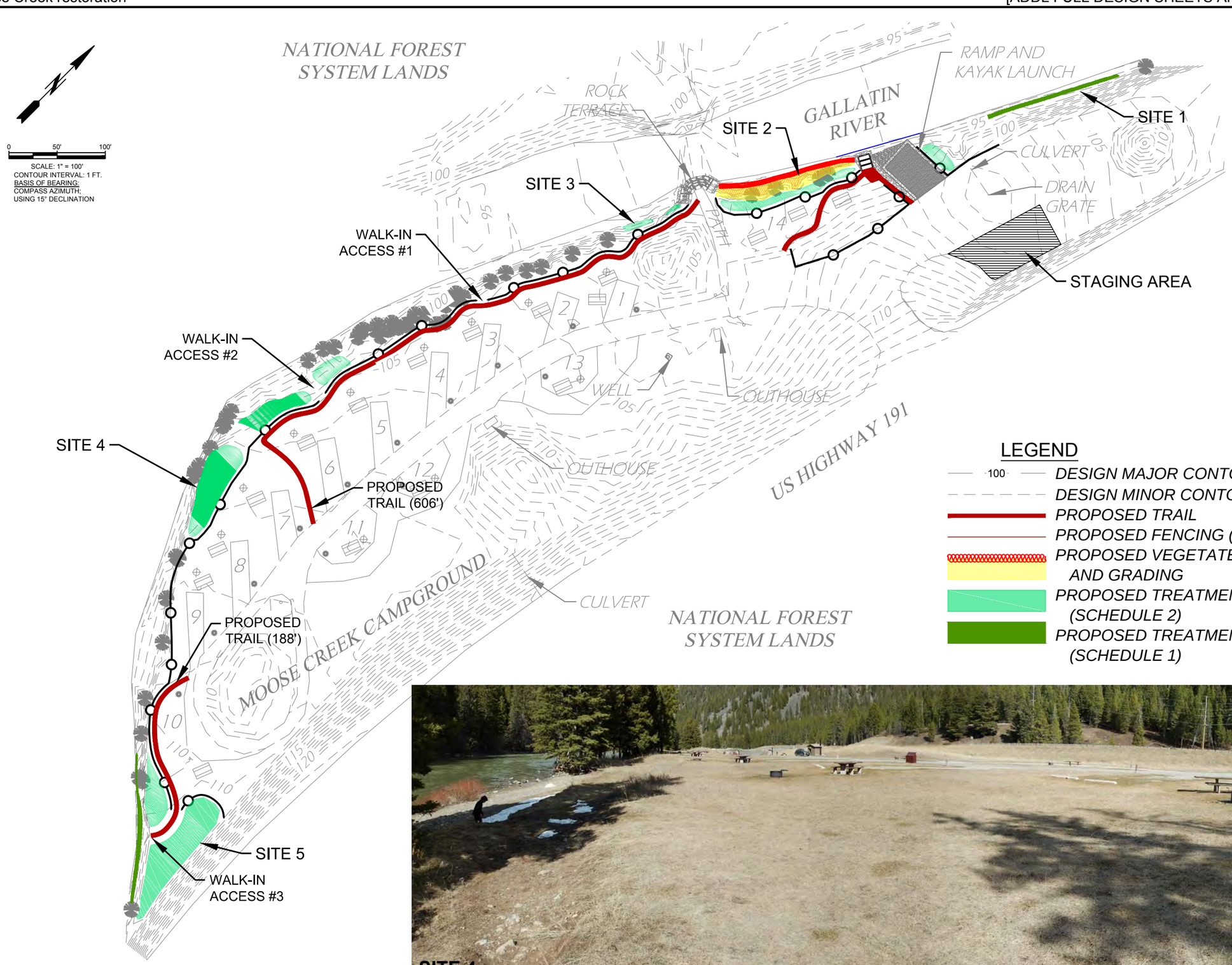
BIG SKY, MT 59716

MOOSE CREEK FLAT RIVER ACCESS IMPROVEMENT - PHASE 2

EXISTING SITE CONDITIONS

SHEET NUMBER: 4
SHEET 4

NAME: S:\PROJECTS\02870 - GRTF - MOOSE FLAT\CAD\SHEETS\02605_S_EXISTING_P2.DWG
PLOT DATE: October 10, 2017 10:54 AM, BY: LIBBY ELLWOOD



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PLOT DATE: October 10, 2017 10:54 AM, BY: LIBBY ELLWOOD

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SUITE 4
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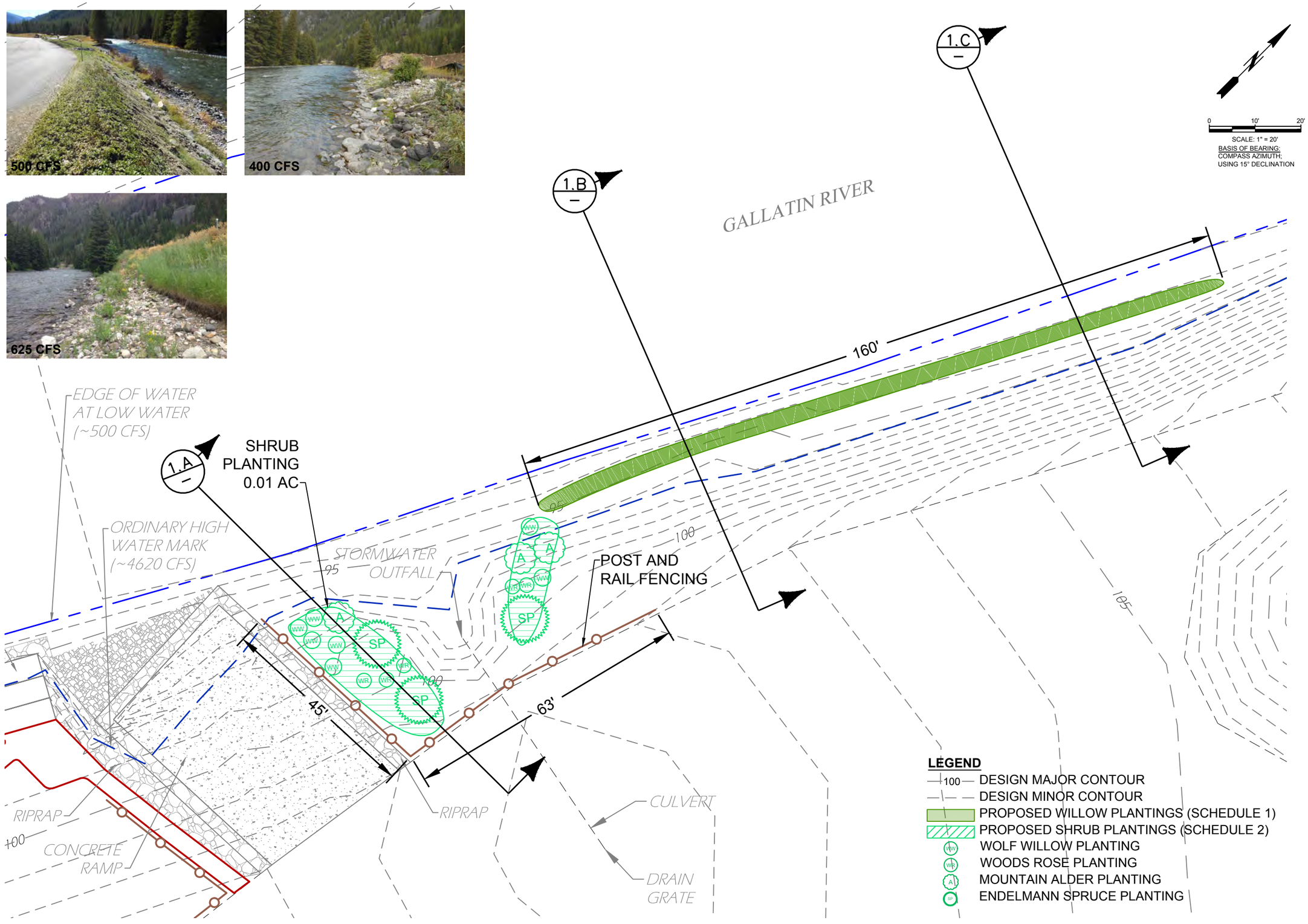
MOOSE CREEK FLAT RIVER ACCESS IMPROVEMENT - PHASE 2

OVERVIEW OF PROPOSED TREATMENTS

SHEET NUMBER: 5

SHEET 5



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MOOSE CREEK FLAT
RIVER ACCESS
IMPROVEMENT -
PHASE 1

SITE 1
WILLOW PLANTING

SHEET NUMBER:
6
SHEET 6

2.A
2.B
2.C
2.D
2.E
2.F
2.G
2.H

EDGE OF WATER AT LOW WATER (~500 CFS)

ORDINARY HIGH WATER MARK (~4620 CFS)

KAYAK LAUNCH

GALLATIN RIVER

FABRIC ENCAPSULATED SOIL LIFTS

145'

ROCK TERRACE AND STAIRS

CONIFER/SHRUB PLANTINGS 0.08 AC

POST AND RAIL FENCING

170'

PATH

TRAIL

RIPRAP

CONCRETE RAMP

33'

105

136'

POST AND RAIL FENCING

19'

SP
SF
SN
WR
WW
CI

0 10' 20'

SCALE: 1" = 20'

BASIS OF BEARING: COMPASS AZIMUTH; USING 15° DECLINATION

LEGEND

- 100 — DESIGN MAJOR CONTOUR
- DESIGN MINOR CONTOUR
- PROPOSED FABRIC ENCAPSULATED SOIL LIFT
- LIMITS OF PROPOSED GRADING
- GRADING BELOW OHWM
- PROPOSED CONIFER/SHRUB PLANTINGS (SCHEDULE 2)
- CI SHRUBBY CINQUEFOIL PLANTING
- WW WOLF WILLOW PLANTING
- SF SUBALPINE FIR PLANTING
- SN SNOWBERRY PLANTING
- SF ENGELMANN SPRUCE PLANTING
- WR WOODS ROSE PLANTING
- SANDBAR AND BEBBS WILLOW PLANTING

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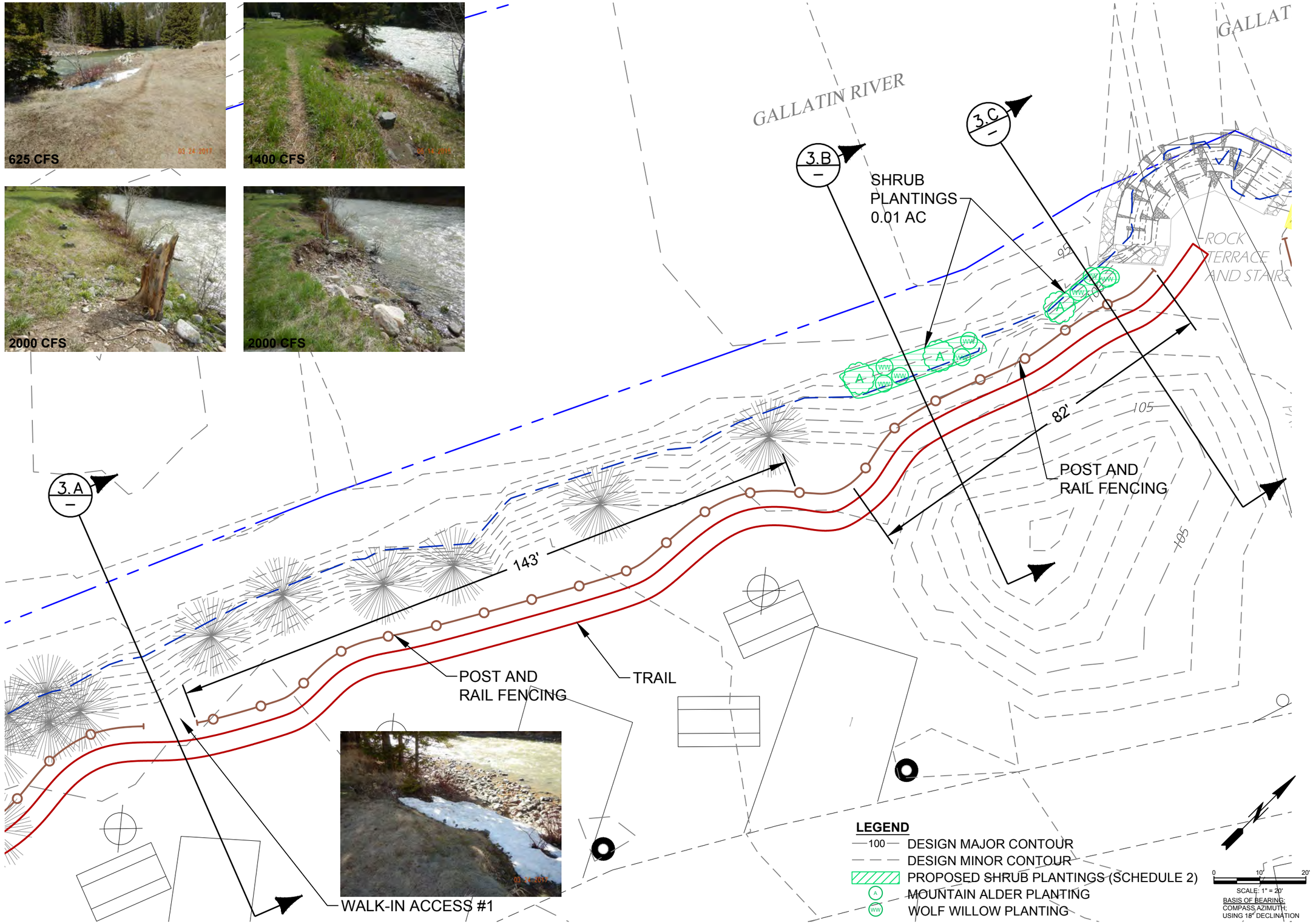
PHASE 1

SITE 2
STREAMBANK
BIOENGINEERING AND
CONIFER, SHRUB AND
WILLOW PLANTING

SHEET NUMBER:
8
SHEET 8



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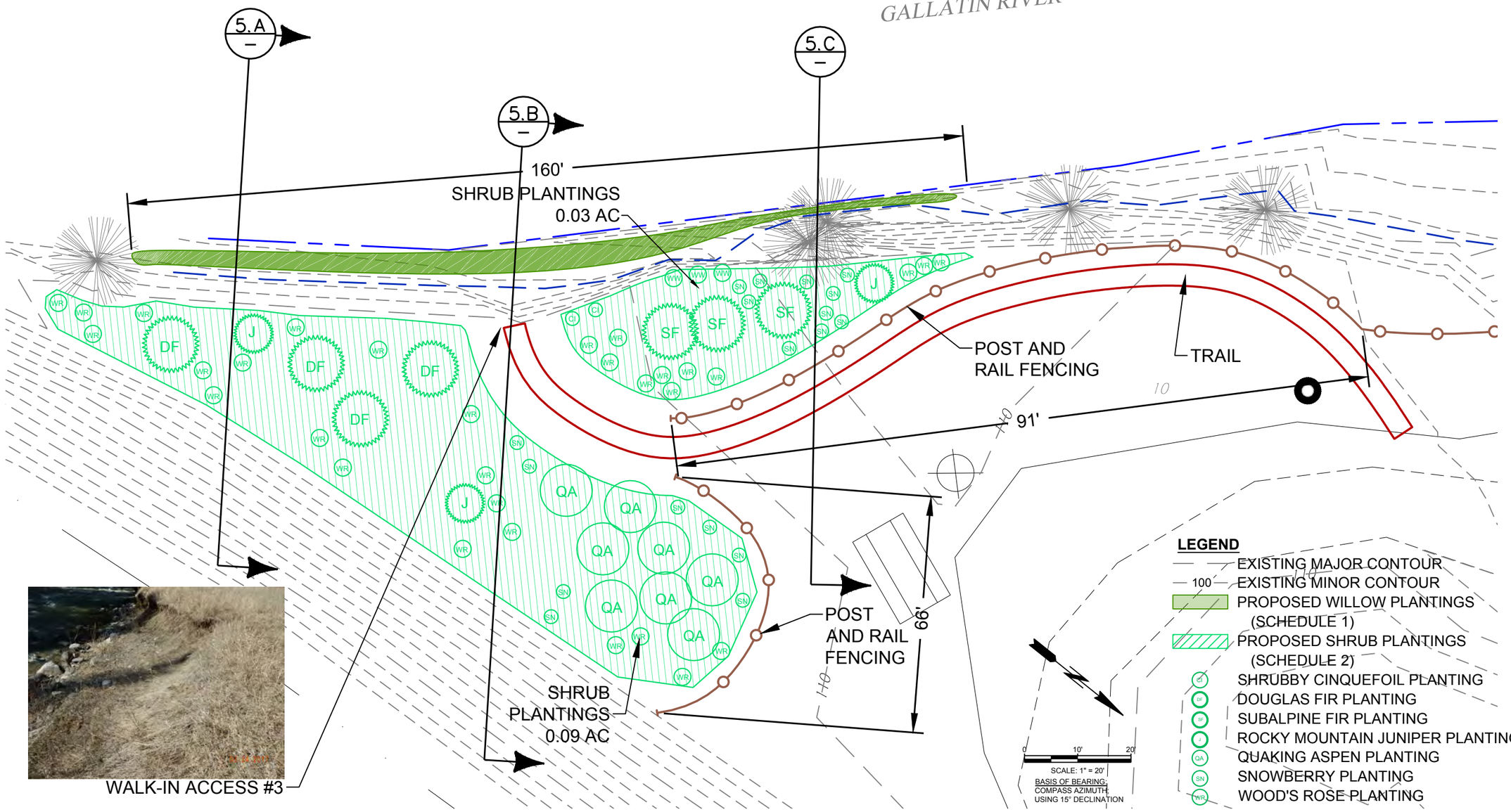
PHASE 2

SITE 3
WILLOW PLANTING

SHEET NUMBER:
11
SHEET 11



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PHASE 2

SITE 5
WILLOW AND SHRUB
PLANTING

SHEET NUMBER:
16
SHEET 16

NAME: S:\PROJECTS\02870 - GRTF - MOOSE FLAT\CAD\SHEETS\02605_S_GRADING_P2.DWG
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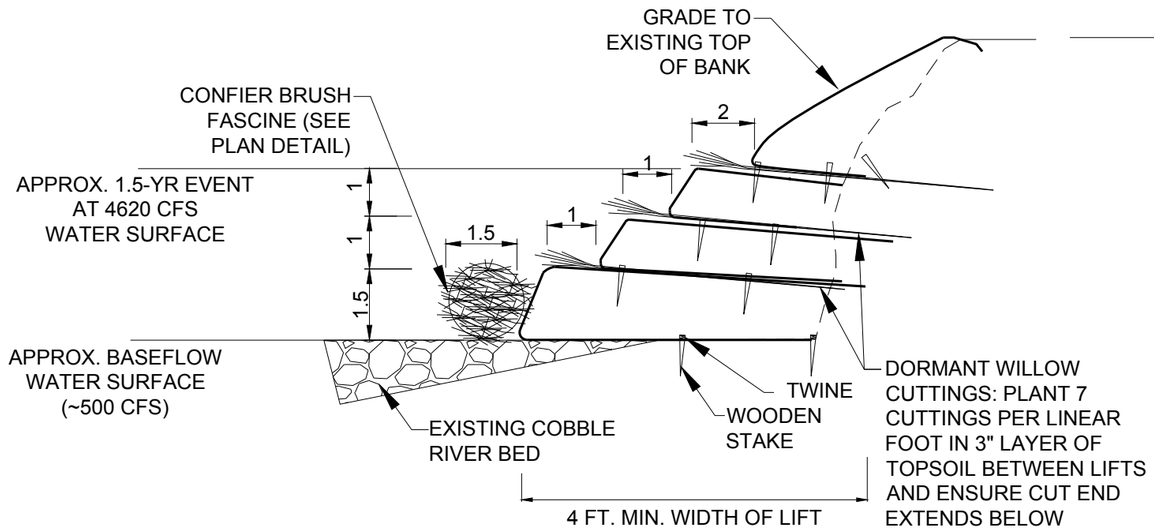

UPPER BANK:

TIE-IN TO EXISTING GRADE AT TOP OF BANK (2:1 (H:V) MAX. GRADE)

UPPER BANK COMPOSED PRIMARILY OF NATIVE TOPSOIL AND GRAVEL. MATERIAL TO BE WRAPPED IN COCONUT (COIR) WOVEN EROSION CONTROL BLANKET OUTSIDE LAYER, AND NON-WOVEN COIR FABRIC INSIDE LAYER. SEED WITH NATIVE UPLAND SEED MIXTURE (SEE SPECIFICATIONS).

LOWER BANK:

3 - FABRIC ENCAPSULATED SOIL LIFTS (SEE DETAILS) TO BE COMPOSED OF NATIVE MATERIAL EXCAVATED DURING PHASE 1 ACTIVITIES ON-SITE. LOWERMOST LIFT COMPOSED PRIMARILY OF LOCALLY SOURCED COBBLE AND GRAVEL RANGING FROM APPROXIMATELY 2" TO 7" (BASED ON SURFACE PEBBLE COUNT DATA). UPPER LIFTS COMPOSED PRIMARILY OF NATIVE SOIL AND GRAVEL. MATERIAL TO BE WRAPPED IN COCONUT (COIR) WOVEN EROSION CONTROL BLANKET OUTSIDE LAYER, AND NON-WOVEN COIR FABRIC INSIDE LAYER. FACES OF LOWER AND UPPER LIFTS TO BE SEEDED WITH NATIVE RIPARIAN STREAMBANK MIX (SEE SPECIFICATIONS).

NOTES:

1. WOVEN COIR FABRIC MATERIAL TO BE 20 OZ/SY IN 9 FT WIDE ROLLS
2. NON-WOVEN COIR FABRIC MATERIAL TO BE 9.8 OZ/SY IN 8 FT WIDE ROLLS
3. NON-WOVEN STRAW FABRIC MATERIAL TO BE 8.7 OZ/SY IN 15.5 FT WIDE ROLLS
4. WOODEN STAKE MIN 18" WITH WIDER HEAD AT TOP, NORTH AMERICAN GREEN ECOSTAKE OR APPROVED EQUAL
5. BIODEGRADABLE TWINE MIN 3/5" DAIMETER

FABRIC ENCAPSULATED SOIL LIFT DETAIL

NOT TO SCALE, ALL DIMENSIONS SHOWN IN FEET

JD/MJ/MR — DESIGNED
JR — DRAWN
JD/MJ/MR — CHECKED
10/2017 — DATE

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MOOSE CREEK FLAT RIVER ACCESS IMPROVEMENT - PHASE 2

FABRIC ENCAPSULATED SOIL LIFT DETAIL

SHEET NUMBER: 18

SHEET 18

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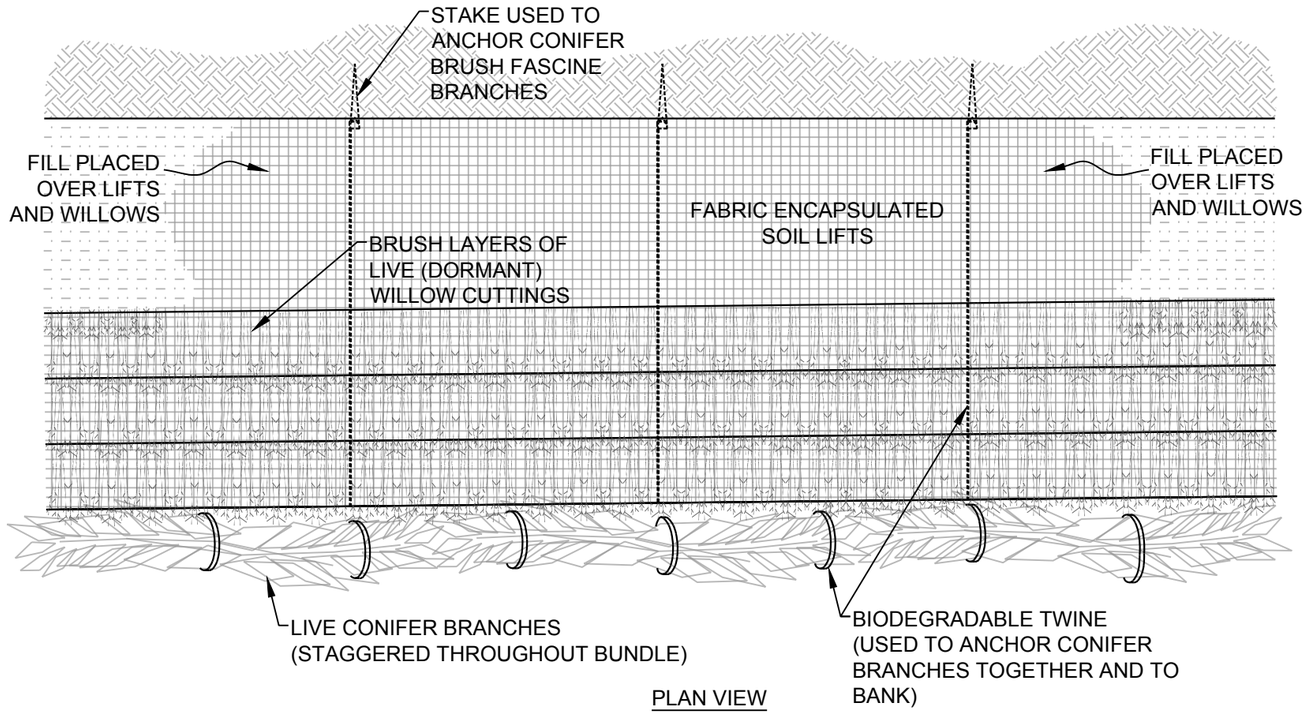

PLAN VIEW

FABRIC ENCAPSULATED SOIL LIFT WITH CONIFER BRANCH FASCINE

NOT TO SCALE

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FABRIC ENCAPSULATED
SOIL LIFT DETAIL

SHEET NUMBER:
19
SHEET 19

STREAMBANK BIOENGINEERING

VEGETATED SOIL LIFTS

1. TO CONSTRUCT A VEGETATED SOIL LIFT, SOIL IS WRAPPED WITHIN TWO LAYERS OF BIODEGRADABLE COIR FABRIC TO CREATE A 12-INCH LAYER OF STABILIZED VEGETATED MEDIA.
2. TO ENSURE SURFACE TENSION IS MAINTAINED WHERE THE CONSTRUCTED BANK RECEIVES THE GREATEST HYDRAULIC STRESS, THE FACE OF THE BOTTOM SOIL LIFT WILL BE REINFORCED WITH A CONIFER BRUSH FASCINE PLACED IN FRONT OF THE LIFT AT THE LOW WATER LEVEL.
3. THE LOWER VEGETATED SOIL LIFT WILL BE CONSTRUCTED ON THE EXISTING COBBLE IN THE CHANNEL BASED ON SITE-SPECIFIC CONDITIONS AS DESCRIBED IN THE CONSTRUCTION DRAWINGS AND UNDER DIRECTION FROM THE ONSITE PROJECT MANAGER.
4. VEGETATED SOIL LIFTS WILL BE ANCHORED IN PLACE USING WOODEN STAKES DRIVEN IN WITH THE TIP TOWARD THE CHANNEL TO MAINTAIN TENSION IN THE BIODEGRADABLE COIR FABRIC WRAP.
5. A SECOND VEGETATED SOIL LIFT WILL BE CONSTRUCTED ON TOP OF THE FIRST WITH A THIN LAYER OF TOPSOIL AND DORMANT WILLOW CUTTINGS (7-8/LINEAL FOOT) PLACED BETWEEN THE LIFTS EXTENDING HORIZONTALLY INTO THE STREAM CHANNEL. WILLOW CUTTINGS ARE TO BE PLACED BETWEEN THE LIFTS AND THE LIFTS SHOULD BE CONSTRUCTED AT A DOWNWARD ANGLE INTO THE BANK TO PROVIDE THE WILLOW CUTTINGS ACCESS TO PERENNIAL WATER.
6. THE SECOND LIFT WILL BE PLACED 1-FOOT BACK FROM THE EDGE OF THE LOWER LIFT.
7. THE UPPERMOST SOIL LIFT SHOULD BE FILLED WITH SUITABLE SOIL MEDIA AND EITHER CAPPED WITH THE STREAMBANK SEED MIX OR CAPPED WITH SOD.
8. THE UPSTREAM AND DOWNSTREAM ENDS SHOULD BE ANCHORED, KEYED, OR OTHERWISE TIED INTO THE EXISTING STREAMBANKS WITH OVERLAPPING (SHINGLING) OF MATERIALS AS NECESSARY TO PREVENT FLANKING OR DISLODGING.
9. PRIOR TO CONSTRUCTING THE VEGETATED SOIL LIFTS, THE CONIFER BRUSH FASCINES, WHICH ARE BUNDLES OF FRESHLY HARVESTED CONIFER BRANCHES, WILL BE BOUND TOGETHER TO CREATE A LOG-LIKE STRUCTURE. THEY ARE CONSTRUCTED USING UNTRIMMED CONIFER BRANCHES AND SMALL TREES, RANGING FROM 4 TO 8 FEET IN LENGTH, BOUND TOGETHER USING BIODEGRADABLE TWINE TO CREATE 6- TO 10-FOOT LONG BUNDLES WITH A MINIMUM 12-INCH DIAMETER. A FEW OF THE THINNER WILLOW BRANCHES CAN ALSO BE INTERTWINED WITHIN THE CONIFER BRUSH FASCINES.
10. THE BUNDLES ARE TO BE LAID END TO END IN FRONT OF THE LOWER LIFT FOR THE LENGTH OF THE TREATMENT WITH THE OVERLAPPING ENDS BEING BOUND TOGETHER WITH TWINE. THERE SHOULD BE APPROXIMATELY THREE FEET OF OVERLAP, WITH THE DOWNSTREAM BUNDLE PLACED TO THE INSIDE OF THE UPSTREAM BUNDLE.
11. BIODEGRADABLE TWINE WRAPPED AROUND THE FASCINE WILL THEN BE ATTACHED TO WOODEN STAKES DRIVEN INTO THE GROUND AT THE BACKSIDE OF THE VEGETATED SOIL LIFT.

WILLOW CUTTINGS

HARVESTING WILLOWS CUTTINGS FOR USE IN BIOENGINEERED STREAMBANKS

1. ONLY CERTAIN SPECIES CAN GENERATE FROM CUTTINGS: SANDBAR WILLOW, BEBB WILLOW, BOOTH WILLOW, DRUMMOND WILLOW AND GEYER WILLOW.
2. CUTTINGS TO BE UTILIZED FOR LIVE PLANTING WILL BE HARVESTED FROM STANDS LOCATED NEAR THE PROJECT SITE THAT ARE HEALTHY STANDS INSPECTED FOR DAMAGE FROM INSECTS OR DISEASE.
3. THE CUTTINGS SHOULD GENERALLY BE ½ TO 1 INCH IN DIAMETER AND LENGTH WILL VARY DEPENDING ON THE DIFFERENT SPECIFIED TREATMENT BUT TYPICALLY 5 TO 8 FEET LONG FOR LAYERING IN THE SOIL LIFTS AND 4 TO 6 FEET FOR WILLOW STAKES.
4. TYPICALLY FOR THE LAYERING TREATMENTS THE WILLOWS DO NOT NEED TO BE TRIMMED, THOUGH THE APICAL MERISTEM SHOULD BE PRUNED FOLLOWING INSTALLATION. FOR INSTALLATION VERTICALLY INTO THE BANKS, WILLOW STAKES SHOULD BE TRIMMED (I.E. SMALL BRANCHES, TWIGS REMOVED) SO THAT ONLY 1/3 OF THE WILLOW STAKE IS ABOVE THE GROUND.
5. LOPPING SHEARS, PRUNING SHEARS, A SMALL WOOD SAW, OR A BRUSH CUTTER CAN BE USED TO HARVEST CUTTINGS.
6. USE LIVE WOOD AT LEAST 2 YEARS OLD OR OLDER. VERY OLD WOOD SHOULD NOT BE USED. THE BEST WOOD IS 2 TO 7 YEARS OLD WITH SMOOTH BARK WHICH IS NOT SPLIT OR DEEPLY FURROWED.
7. AVOID WHIPS OR SUCKERS (CURRENT YEAR'S GROWTH) BECAUSE THEY LACK THE STORED ENERGY RESERVES NECESSARY TO CONSISTENTLY SPROUT WHEN PLANTED.
8. NO MORE THAN 1/3 OF ANY INDIVIDUAL PLANT SHOULD BE REMOVED. IN THE CASE OF RHIZOMATOUS SPECIES, NO MORE THAN 40 TO 50% OF THE STAND SHOULD BE REMOVED.
9. SELECT BRANCHES WHICH ARE FREE OF INSECTS OR DISEASE.
10. IMMEDIATELY FOLLOWING HARVESTING, ALL WILLOW CUTTINGS WILL BE BUNDLED IN GROUPS OF 20 FOR EASE OF COUNTING AND DISTRIBUTION.
11. ALL CUTTINGS HARVESTED IN THE SPRING WILL BE SOAKED FOR 7 TO 14 DAYS PRIOR TO INSTALLATION. CUTTINGS WILL BE HARVESTED DURING PLANT DORMANCY BEFORE THE SPRING BUD BREAK (TYPICALLY PRIOR TO APRIL 15) OR THE FALL (AFTER LEAF FALL IN LATE OCTOBER).
12. SOAKING CAN BE ACCOMPLISHED IN A DITCH, STREAM, POND OR OTHER BODY OF FLOWING WATER THAT IS DEEP ENOUGH TO COMPLETELY COVER THE CUTTINGS.
13. IF DORMANT WILLOW CUTTINGS ARE INSTALLED IN THE FALL, THE WILLOW CUTTINGS DO NOT REQUIRE SOAKING PRIOR TO PLANTING ALTHOUGH IT DOES NOT HARM THE STEM IF SOAKED.

VERTICAL WILLOW INSTALLATION

1. THE PLANTING DIRECTION WILL BE THE SAME AS DURING GROWTH (I.E. BUDS POINT UPWARD).
2. CUTTINGS CAN BE INSTALLED USING A 5 TO 6-FOOT LONG EXCAVATOR-MOUNTED DIBBLE BAR, SOIL AUGERS, A WATERJET STINGER, PLANTING BARS, OR BY PUSHING THE CUTTINGS INTO MOIST SOIL BY HAND.
3. THE RECOMMENDED INSTALLATION METHOD IS THE EXCAVATOR MOUNTED DIBBLE BAR DUE TO THE DIFFERENT BANK DEPTHS AND INSERTION THROUGH EROSION CONTROL FABRIC. THE PLANTING DEPTH AND TREATMENT WILL DETERMINE THE PLANTING METHODS.
4. WILLOW CUTTINGS WILL BE PLANTED ON TOP OF BANK DEPENDING UPON THE SPECIFIED BANK TREATMENT. CUTTINGS WILL BE INSERTED DEEP ENOUGH TO REACH THE LOW OR MID-SUMMER WATER TABLE AS FOLLOWS:
   a. AT LEAST 6 INCHES OF THE CUTTING ARE IN THE LOW WATER TABLE.
   b. 3 TO 4 BUDS ARE ABOVE THE GROUND SURFACE ELEVATION.
   c. 1 TO 4 CUTTINGS CAN BE PLACED SMALL CLUSTERS IN EACH HOLE.
5. IF WEEDS OR TALL INVASIVE GRASSES ARE A CONCERN, THE CUTTINGS SHOULD EXTEND ABOVE THE HERBACEOUS GROWTH TO RECEIVE ADEQUATE LIGHT AND BELOW THE HERBACEOUS ROOT MASS TO MINIMIZE COMPETITION.
6. IT IS ESSENTIAL TO HAVE GOOD CONTACT BETWEEN CUTTINGS AND SOIL FOR ROOTS TO SPROUT. AIR POCKETS AROUND THE CUTTINGS WILL KILL THE ROOTS.
7. ADDITIONAL SOIL OR SAND MAY BE SEEDED TO ENSURE GOOD SOIL TO STEM CONTACT. PREFERENCE SHOULD BE GIVEN TO NATIVE SOIL NEARBY TO ENCOURAGE MYCORRHIZAL FORMATION AND/OR NODULE FORMATION BY NITROGEN-FIXING ORGANISMS.
8. MUD OR “WATER-IN” THE CUTTINGS AFTER THEY ARE PLACED IN THE HOLE. USE THE EXCAVATOR BUCKET (FOR WATER) FOLLOWED BY PLACEMENT OF SOIL AS NEEDED.
9. FOLLOWING INSTALLATION, VERTICALLY INSTALLED WILLOWS WILL LIKELY REQUIRE TRIMMING, I.E. THE TOPS CUT OFF SO THAT ONLY 1/3 OF THE WILLOW CUTTINGS IS ABOVE GROUND. THIS WILL VARY BASED ON THE CUTTING LOCATION AND BANK TREATMENT. THIS CAN EASILY BE DONE BY USING LONG-HANDLED LOPPERS.
10. CLEAN-UP WOULD REQUIRE EITHER TOSSING THE CUT STEMS INTO THE WATER OR IN BUCKETS OR BAGS FOR REMOVAL OR PLACEMENT AS WOODY DEBRIS WITHIN THE FLOODPLAIN.

CONTAINERIZED PLANTINGS

1. ENGELMANN SPRUCE WILL BE PLANTED WITH 10-FOOT SPACING.
2. WILLOWS AND SHRUBS WILL BE PLANTED WITH 6-FOOT SPACING.
3. THE DESIGNER WILL IDENTIFY THE PLANTING LOCATION, DENSITY AND SPECIES FOR EACH PROJECT AREA BY USING PLANT SYMBOL CODED PIN FLAGS, LATH OR OTHER APPROPRIATE MEANS.
4. THE PLANTING HOLES WILL BE DONE EITHER BY HAND OR WITH AN AUGER (THIS IS THE PREFERRED METHOD ESPECIALLY FOR LARGER NURSERY STOCK). A 6" AUGER MOUNTED TO A MINI TRACTOR EXCAVATOR IS THE IDEAL SIZE.
5. TO ASSESS SOIL MOISTURE AND HYDROLOGY, THE PLANTING HOLE SHOULD BE LEFT OPEN FOR 24 HOURS. IF HYDROLOGY IS NOT CONDUCIVE TO SUPPORT PLANT GROWTH (TOO DRY FOR WILLOWS), THE HOLE MAY BE FILLED AND ANOTHER HOLE DUG IN THE SAME VICINITY OR THE IDENTIFIED/MARKED FOR SUPPLEMENTAL IRRIGATION.
6. PRIOR TO PLANTING, ALL CONTAINERIZED PLANTS WILL BE FULLY PROTECTED FROM SEVERE WEATHER (TARPS, STORAGE BUILDINGS OR PROTECTIVE BOXES). THERE SHOULD BE COORDINATED DELIVERY SCHEDULING TO AVOID HAVING CONTAINERIZED PLANTS LEFT OUT.
7. UPON ARRIVAL, ALL PLANT MATERIALS WILL BE INSPECTED FOR GENERAL HEALTH AND TO ENSURE THAT THE CONTAINERIZED SOIL IS WEED FREE. PLANTS WILL NOT BE ACCEPTED IF THEY ARE DAMAGED OR UNSUITABLE.
8. PLANTING WILL NOT BE DONE IN SOIL THAT IS FROZEN, EXCESSIVELY WET, OR OTHERWISE IN A CONDITION NOT SATISFACTORY FOR PLANTING IN ACCORDANCE WITH ACCEPTED HORTICULTURAL PRACTICE.
9. FOR TREES, ROOTS ON ROOT BOUND PLANTS WILL BE SCORED OR RIPPED 1/4 TO 1/2 INCH DEEP ON THE EDGES OF THE ROOT BALL. THE PLANTING HOLE WILL BE DUG APPROXIMATELY 50 PERCENT WIDER AND 25 PERCENT DEEPER THAN THE CONTAINER. THE BOTTOM OF THE HOLE WILL BE BACKFILLED BY HAND TO A DEPTH EQUAL TO THE HEIGHT OF THE CONTAINER.
10. INSERT THE TREE INTO THE CENTER OF THE PIT AND SET SO THAT THE TOP OF ROOT BALL IS APPROXIMATELY PLUMB TO THE FINAL GRADE (I.E., AT THE SAME DEPTH AT WHICH IT WAS GROWN) FOR THE CONTAINERIZED WILLOWS AND SHRUBS. FOR CONTAINERIZED CONIFERS, INSERT THE TREE INTO THE CENTER OF THE PIT AND SET SO THAT TOP OF ROOT BALL IS 1 TO 2 INCHES ABOVE THE FINAL GRADE TO ACCOUNT FOR SETTLING. IF THE PIT IS MISTAKENLY DUG TOO DEEP, SAND OR CLEAN BACKFILL SHALL BE UTILIZED TO COMPENSATE FOR THE PROPER ELEVATION.
11. AFTER THE PLANT IS STABILIZED, BACKFILL AND CAREFULLY WORK SOIL AROUND AND OVER THE PLANT ROOTS AND THOROUGHLY SETTLE BY FIRMING AND HAND TAMPING UNTIL THE PIT IS BROUGHT UP TO FINISHED GRADE. FIRMING THE SOIL AROUND THE TREE SHALL BE DONE IN A MANNER TO ASSURE NO DAMAGE IS DONE TO THE TREE OR ROOT SYSTEM. EXCESS SOIL MATERIAL WILL BE USED TO CONSTRUCT A LOW BERM AROUND THE PLANT TO AID IN MOISTURE RETENTION.
12. THE ORIGINAL SOIL FROM THE HOLE WILL BE FILLED IN AND FIRMED AROUND THE PLANT ROOTS OR PLUG. SOIL WILL BE FILLED IN AND FIRMED PROGRESSIVELY SO NO LOOSE SOIL OR AIR POCKETS REMAIN AND THE TREE OR SHRUB IS AS FIRMLY PLANTED AS SOIL CONDITIONS WILL ALLOW. EXCESS SOIL MATERIAL WILL BE USED TO CONSTRUCT A “WATER WELL” (LOW BERM) AROUND THE PLANT TO AID IN MOISTURE RETENTION. ALL PLANTS SHALL BE “WATERED IN” FOLLOWING PLANTING.

DESIGNED JD/MJ/MR JR
DRAWN JD/MJ/MR
CHECKED 10/2017
DATE

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MOOSE CREEK FLAT
RIVER ACCESS
IMPROVEMENT -
PHASE 2

PLANTING NOTES

SHEET NUMBER:
20
SHEET 20

Moose Creek Flat
River Access Improvement
Implementation Report

Phase 1 Construction
Phase 2 Streambank Bioengineering

November 27, 2017

MOOSE CREEK FLAT
RIVER ACCESS IMPROVEMENT
IMPLEMENTATION REPORT

by
Jeff Dunn, Watershed Hydrologist

RESPEC

3810 Valley Commons Drive, Suite 4
Bozeman, Montana 59718

prepared for

GALLATIN RIVER TASK FORCE

PO Box 160513
Big Sky, Montana 59716

November 27, 2017

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1.0 INTRODUCTION

The purpose of the Moose Creek Flat River Access Improvement Project is to reduce streambank erosion by focusing river access to designated locations and enhancing the surrounding riparian vegetation along the Gallatin River. Project implementation conducted in fall of 2017 included the construction of a boat ramp, kayak launch, and rock terrace, along with trail construction, streambank bioengineering, and riparian plantings with willow cuttings. Additional riparian plantings with containerized vegetation and fencing will occur in the spring of 2018. Installed practices and before, during and after photos documenting the construction and planting process are summarized in this report.

2.0 INSTALLED PRACTICES

Installed practices in the fall of 2017 include:

Boat Ramp
The boat ramp was constructed using approximately 43 cubic yards of concrete. The toe of the boat ramp was secured using riprap from the Cascade Pit, which was covered with a layer of river cobble excavated from the site. Grooving was applied to the surface of the boat ramp using grooving tools provide by Montana Fish, Wildlife and Parks.

Kayak Launch
The kayak launch was constructed using six placed stones weighing an estimated 26 tons, along with additional rock salvaged from the old bridge abutment, riprap from the Cascade Pit, and river cobble to secure the toe and tie into the boat ramp on the downstream end and the bioengineered streambank on the upstream end. Each tier of stone was encased in concrete.

Rock Terrace
The rock terrace was constructed using 29 placed stones weighing an estimated 93 tons, along with additional rock salvaged from the old bridge abutment, riprap from the Cascade Pit, and river cobble to secure the toe and tie into the bioengineered streambank on the downstream end and the natural streambank on the upstream end. Each tier of stone was encased in concrete.

Trail
Four sections of trail were completed totaling approximately 1,120 feet, including approximately 790 feet of elevated trail through the campground, approximately 80 feet of reconstructed trail leading from the parking lot to the rock terrace, and approximately 250 feet of trail connecting the parking lot to the kayak launch and the boat ramp. The contractor intends to perform touch-up work on the trail in the spring of 2018.

Bioengineered Streambank
A 145-foot long section of streambank extend from the rock terrace downstream to the kayak launch was restored using bioengineering techniques. Approximately 3,000 willows were placed in four layers between fabric encapsulated soil lifts at a spacing of 3-7 willows per linear foot for an overall density of 21 willows/linear foot. In addition, 300 willows were placed vertically in the streambank using a stinger. Willows were harvested between October 23rd and October 27th and placed in the streambank between November 9th and November 14th. All willow cuttings were soaked in the Gallatin River for a period of 2-

3 weeks between harvest and planting. Willows were harvested from various sites in the Gallatin canyon, including Porcupine Creek, Storm Castle Creek, Spanish Creek, and the Gallatin River at Greek Creek. In addition, sandbar willows were harvested in the Gallatin valley. Harvested species included Booth's willow (*Salix boothii*), Bebb's willow (*Salix bebbiana*), Drummond's willow (*Salix drummondiana*), sandbar willow (*Salix exigua*), and Geyer's willow (*Salix geyeriana*).

Riparian Plantings

Riparian plantings conducted in the fall of 2017 included the placement of willow cuttings using a stinger at Sites 3 and 5, with 83 cuttings placed in Site 3 and 94 cuttings placed in Site 5. An attempt was made to use the stinger at Site 1, but the substrate was too coarse. Additional riparian plantings with containerized vegetation are planned for the spring of 2018.